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† Deceased

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Revery and Industrial Fatigue[1]

By Elton Mayo, *Wharton School, University of Pennsylvania*

The mental attitude of the man on the job is sometimes more potent in determining output than relative machine-speeds, bonus incentives, or careful vocational selection methods. Striking experimental proof of the effects of mental attitude, perhaps due in part to postural fatigue, on labor turnover and output has been found in a Philadelphia textile mill. This vivid illustration of the principles set forth in Professor Mayo's two previous articles in this Journal[2] shows what happens when total-situation psychology is taken into the plant.

IT IS ordinarily assumed that high productive efficiency is chiefly secured by close organization of machine operation, by careful routing, by vocational selection of workers employed and by task and bonus systems. That these items of organization are of high importance must be at once admitted; the fact remains that they fail of effect unless account be taken of the attitude of the worker. Evidence is gathering which goes to show that the single, most important factor which determines productive efficiency is the mental preoccupation (or revery) of the worker as he works.

AN EXPERIMENT IN A TEXTILE MILL

In this paper, I propose to describe a labor situation in a textile mill that provides an illustration of my claim. Rather more than twelve months ago, we were asked to discover, if possible, the causes of a high labor turnover in the spinning department of this mill. The general condition of affairs seemed satisfactory. The employers were unusually enlightened and humane; the factory was exceedingly well organized in respect of the items specified above, and was generally successful from the standpoint of production and of morale. Four financial incentive schemes were in operation and were working sufficiently well. But in spite of these devices, the labor turnover in the spinning department was, at the time of investigation, unduly high. Whereas the general labor turnover of the factory in other departments was estimated at 5 or 6 per cent per annum, in the spinning department, it was estimated by an executive authority as approximately 250 per cent. Every year one hundred hands had to be taken on in order to keep

[1] Read in part at the Toronto meeting of the British Association for the Advancement of Science, August, 1924.

[2] Elton Mayo: "The Irrational Factor in Society." *Journal of Personnel Research*, 1923, Vol. I, No. 10, pp. 419–426. "Irrationality and Revery." *Ibid.*, pp. 477–483.

forty working. The difficulty tended to be most acute when the factory was busily employed and most in need of men.

Conditions in the plant

On first glance, the conditions of work in the department did not seem noticeably inferior to conditions of work elsewhere in the factory. Formerly the factory worked on Saturday, but for some time this has been discontinued. Spinners like other operatives consequently work on five days only in the week. The working day is ten hours in length, five in the morning and five in the afternoon; there is an interval of three-quarters of an hour for lunch. The work is done in long alleys on either side of which a machine-head is operating spinning-frames. The number of spinning-frames operated by each machine-head varies from ten to fourteen; all these frames have to be closely watched by the head-tender and piecers in charge.

The number of piecers in an alley varies according to the kind of yarn that is being spun; the distance between the terminal frames is from 30 to 40 yards. The work is monotonous; the piecer walks up and down the alley twisting together broken threads. The only variation in work is that which occurs when the machine-head is stopped in order to doff or to replace a spool. Breakdowns are fairly frequent.

Postural fatigue and irritability

Our investigation was begun in circumstances of some difficulty. The proprietors had previously availed themselves of the services of various "experts" without result. Consequently, although they had requested our aid, they wished us in the first instance to enter the factory merely as visitors. The evidence we gathered was therefore obtained at first by observation and by conversation directed to reveal the nature of the reveries that accompanied work. By this means we speedily discovered that almost every worker suffered from foot-trouble for which he apparently knew no effective remedy. Many also laid claim to neuritis in various localities of arm, shoulder and legs. In addition to this, we discovered that their reveries were apparently monotonously and uniformly pessimistic. Occasionally a worker would flare out into apparently unreasonable anger and incontinently leave his job. Their own opinion of their work was low. "You need strong legs and no brains for this work." "Piecers get disgusted, they are always getting disgusted." In spite of this, the greater number seemed to have no desire to change to another type of work; instead, they changed their factory from time to time.

Rest periods introduced

After some discussion of the evidence and the situation, the management agreed to institute two or three ten-minute rest-periods in the morning and again in the afternoon. In these periods, the workers were to be permitted to lie down; we undertook to instruct them in the best method

of muscular relaxation.[3] By this means, we hoped to remedy, at least in part, the postural fatigue they suffered and also to interrupt and, if only temporarily, dispel the pessimistic revery.

We began with one team of piecers, about one-third of the total number, and the results were interesting from the first. The men themselves were pleased and interested; they speedily adopted the method of rest we advised. The effect was immediate—symptoms of melancholy preoccupation disappeared, the labor turnover ceased, production was maintained, the morale generally improved. It became evident that such marked effects could not be attributed to the mere elimination of physical fatigue. In the first place, the effect showed itself immediately whereas, according to investigators such as C. S. Myers and H. M. Vernon, the relief of physical fatigue is not expected to show for possibly two months. In the second place, the improvement of morale seemed to include workers not upon the team. In October of last year, the management, pleased with the improved condition of the men, decided to extend the rest-period system to include the entire personnel of the spinning department. This made it possible for us to do what we could not do before—to measure the effect of the rest-period upon the productivity of the department. Until October, 1923, the spinning department had never earned a bonus; in October and every month since, with one interesting exception, the spinners have made a bonus addition to their wages.

[3] The interruptions or ten-minute rests are so contrived that the working periods are

2 hours work
10 minutes rest
1 hour 30 minutes work
10 minutes rest
1 hour 10 minutes work

5 hours

Effect on output and turnover

Figure 1 shows the daily productivity of the spinning department from October 1, 1923, to June 30, 1924, calculated in terms of efficiency percentage. The actual weight of yarn that is spun does not provide a satisfactory criterion of production, since a thick thread weighs more than a thin one but takes less labor per unit of weight. The mill has therefore devised a scheme by which times are set for the spinning of unit weights of the various types of yarn. The time allowed in each case has been experimentally determined, allowance being made for time lost in doffing, machine breakdowns and so on. The time allowed ranks as 100 per cent and the department is asked to average 75 per cent for the working days in the month in return for the flat-rate wage paid. If the monthly man-hour efficiency of production averages over 75 per cent, then the extra percentage is paid as a bonus on wages. Thus an 80 per cent average means a 5 per cent bonus on his wages to every employee in the department. On the other hand, if the average falls below 75 per cent, the basic wage is nothing diminished. I use this chart not because we are necessarily interested in increasing production, but rather because it offers an interesting, and so

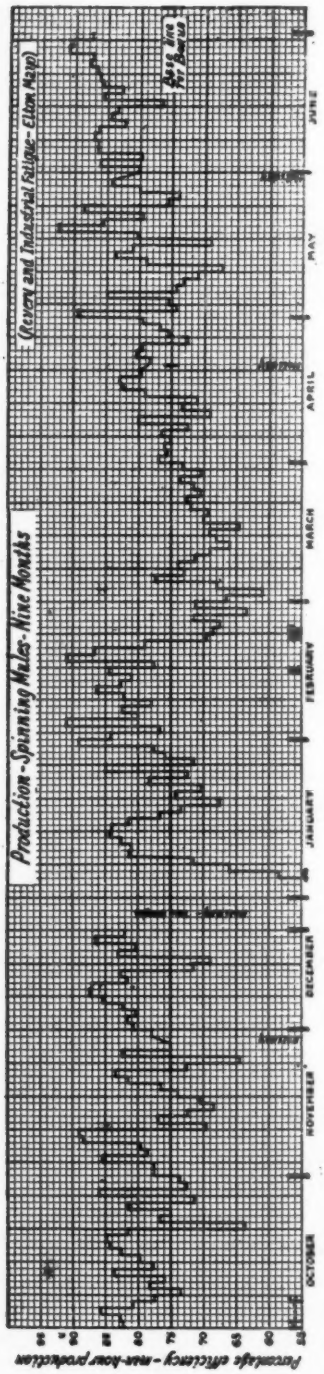

FIG. 1

far accurate, measure of the general effect of the humaner organization of work upon the men.

The period from October, 1923, to January, 1924, demands no lengthy comment. The mental and physical condition of the men continued to improve and whereas the financial incentive of the bonus had not operated to stimulate production while they were fatigued, they now began to be pleased by the fact that they were earning bonuses as never before, and yet simultaneously feeling less fatigued. The system was not, however, altogether satisfactory. It had occurred to some one in the factory (not an executive officer) that the rest-period idea might be improved. The men were accordingly made to "earn" their rest-periods; that is, they did not necessarily get a rest at a set time, they were allowed to rest only after completing a certain operation. This meant that they could not expect a definite number of rests at stated periods. On some days, they had two rest-periods only. For the most part, they had three or four in the day and the innovation worked fairly well.

This general condition continued until Friday, February 15 (see chart), when in response to a heavy demand for goods, the rest-period system was abandoned. For a week, the department continued to work without rests and on the following Friday, February 22, I found that the old pessimistic reveries had returned in full force accompanied by some of the former symptoms of fatigue. I immediately appealed to the executive officer in charge and he ordered the resumption of the rest-periods on Monday, Febru-

ary 25. The chart is especially illuminating at this point. I had at the time no knowledge of the sharp fall in productive efficiency that was taking place. I had based my action entirely on the symptomatic revery I had come to know. On Monday and through March, the rest-periods were resumed, but the old unsatifactory method of requiring the men to earn their rest-periods was employed. The consequence was that in March, the incidence of rest-periods was highly uncertain and irregular. On a given day, certain men might have no rests at all, others would have one, two, three, or rarely four. In spite of this, the productive capacity of the department shows in the chart, a distinct tendency to improvement in the latter part of March—a tendency which I attribute to diminished physical fatigue rather than to mental causes.

At the end of March, the president of the concern summoned a conference to discuss the cause of the remarkable diminution from 80 to 70 per cent in respect to productive efficiency. We were able to point out that in March there had been a recrudescence of absenteeism, an ill which had notably diminished in the October to February period. This recrudescence meant that the men were taking their rest-periods in the form of "missed" days, a proceeding which did not greatly remedy their fatigue and which produced chaos in the factory. We put it therefore that the question was not whether a certain proportion of their working time was to be given up to rest. We were asking in effect that a less proportion should be thus allotted, but that it should be done systematically. In addition to this we were able to claim that the whole rest-period system had never had a fair trial. In other words, it had not been possible for a worker to know as he entered the factory in the morning that he was assured of a definite number of rest-periods in the day.

At this stage in the discussion, the president decided upon a somewhat heroic experiment. He ordered that during the month of April, the spinning-mules should be shut down for ten minutes at a time four times per day and that all hands from the foremen down should lie down and rest as they had been instructed to do. There was some difficulty in securing the requisite amount of floor-space for approximately forty men to lie down by their machines and in securing sufficient sacking to provide for their comfort. With the exception of the president himself, there were few who believed that this drastic alteration of method would result in increased production. The men themselves believed that the forty minutes lost by forty men per day could not be recovered. They pointed out that the machines could not be speeded up and that "there was no other way of recovering the lost time." In spite of this, the returns for April showed an improvement on March. The March figure had been 70 per cent, the April figure was 77½. This, while it represented a 7½ per cent gain in the company's rating, was actually a 10 per cent improvement. The men had had their rests, the pessimistic revery had again disappeared; simultaneously their morale had much improved, and they had earned a two and a half

per cent bonus. In the month of May and thereafter, the president ordered a return to the system of alternating rest-periods, with this difference, that each group of three men in an alley was to determine for itself the method of alternation, the understanding being that every worker was to have at least four such periods daily. In the month of May, the average efficiency of man-hour production was 80¼ per cent. In June, it reached the then record high figure of 85 per cent. July, August and September are not included on the chart, but in spite of distressing summer heat and other difficulties, the department has maintained its improved capacity, the figures being 82 per cent for July, 83½ per cent for August, and 86½ for September.

I have unfortunately no figures which show the average productive efficiency of the Department in the period prior to that in which the experiment began. It is generally admitted, however, that it was not better than would be indicated by a figure between 70 and 75 per cent. There is a strong probability that the average production over several months was not better than 70 per cent. The figures representing the daily productivity for March give some idea of the conditions of things obtaining in the department before the introduction of rest-periods. As against this must be set the increased productive capacity of considerably over 80 per cent for the ten months of experiment; simultaneously the morale of the department has improved, physical fatigue and absenteeism have diminished, the mental attitude of the men to their work is cheerful and normal. The investigation began in a question as to the causes of a very high labor turnover. In the twelve months of investigation, there has been no labor turnover at all. I do not mean that no worker has left the factory—during a period of trade slackness some were laid off, one at least has moved his place of residence and obtained work elsewhere, another has been sent to the country since he was found to be phthisical. But the former problem of an emotional or temperamental labor turnover has ceased to exist. The factory now holds its workers and has no difficulty in maintaining a full complement in times of rushed work. The attitude of the management to the innovation is revealed in the fact that they have recently (September) determined to purchase army cots for the men to use during the rest periods, experience having shown that the benefit is directly proportionate to the completeness of the relaxation.

It is interesting to observe the difference which an absolute certainty of a minimum number of rest-periods has made. The months from April to September (to June in the chart) differ from the preceding months in this respect and they reveal a steady progress. Mondays and Fridays are no longer the worst days in the week. The irregularity observable in May was due to the fact that the spinning-mules were constantly "running away from the cards," that is, outdistancing the carding machines which supply them with spooled yarn. By June this defect of organization had been remedied and June is just as steadily above 85 per cent as March was

below 75 per cent. Upon the one day in June when production was relatively low (76½ per cent) there was a machine breakdown in one part of the department.

Mental preoccupations of the workers

The investigation is not as merely general as this paper might seem to indicate. In the twelve months during which we have been permitted to use this textile mill as a laboratory for intensive investigation, there has been accumulated much evidence in detail of the type of revery that preoccupies the mind of the worker at work. We have found instances of men who, after four years, still permitted themselves to dwell upon painful war experiences; we have found a much greater number of men and women who were much preoccupied during working hours with difficulties of domestic situation. Individual situations are carefully and, as far as possible, thoroughly investigated; four-fifths of the total number of employees have welcomed such inquiry and counsel. Confidences are in every instance respected and are never communicated to executives or management. I cannot here discuss the nature of the psychological technique we are attempting to devise. I must content myself with the assertion that we recognize four general directions of inquiry—the personal history of the individual (including his dominant reveries), his medical history, his present domestic situation and the effect upon him of his occupation. The investigation owes much to the collaboration of the Graduate Medical School of the University of Pennsylvania which has placed the services of its specialists at our disposal for purposes of medical inquiry.

PSYCHOLOGICAL INTERPRETATIONS

Monotony and pessimistic revery

In industrial and economic writings much comment has been made in recent years upon the monotony of machine operation. Some writers have claimed that the effect of monotonous work upon the individual is exceedingly bad; others have regarded it as negligible. While this discussion has served to show that a problem undoubtedly exists somewhere in this area, it has done little or nothing to define the problem clearly or in detail. The investigation of revery seems to show that the essential problem is that as to *the mental preoccupations induced in the workers by the conditions of their work*. Speaking generally, it may be said that an individual's daily work or avocation may serve to minimize or to intensify any preexisting tendency to pessimistic or paranoid meditation. Everyone, worker or executive, probably carries with him a private grief or discontent. Wherever the conditions of work are unsuitable, physically or mentally, the immediate effect seems to be an increase of pessimistic or bitter reflection. The opinion of the worker as to the suitability or otherwise of his working conditions is apparently of no value in this respect. A given worker may believe that he is content with his job because of the revery that preoccupies him. This same revery may nevertheless tend to unfit him as a producer or as a citizen

and father or both at once. And even if the worker is not content with his job, he is usually as powerless as the executive who commands him to define the ground or cause of his discontent. It is not monotony in itself that is necessarily bad, but rather repetitive work under conditions that make for the development of pessimistic or other abnormal preoccupation.

Fatigue and irrationality

In conclusion, I return for a moment to the question of the relation of pessimistic reveries to work, to fatigue and to irrationality. For many years past, the leading psychiatrists of the world have called attention to the close relation that obtains between fatigue and nervous breakdown and between habitual revery and neurotic unreason. Charcot and Janet, in the latter part of the nineteenth century showed that hysteria is a form of sleep-walking, a mental condition of preoccupation which disregards external reality. In his work upon neurotic disorders, Janet points out that everyone who suffers fatigue displays certain of the typical symptoms of psychasthenia, such as "motor agitation, tics, irritability, obsessing revery" (Janet, Les Névroses, p. 358).

In further description of the form of mental breakdown he terms psychasthenia, Janet calls attention to the "lowering of mental tension" and "the diminution of the functions which permit action on reality and perception of the real" (op. cit., p. 367). To point out that these two characters do not merely manifest themselves in the psychasthenic mentality is fair comment. All revery or preoccupation is more or less "drifting," the mental tension is lowered and the active perception of reality is simultaneously much diminished. The distinction between normal revery and its psychasthenic counterpart is found rather in the latter part of Janet's definition—"the substitution of inferior and exaggerated operations in the form of doubts, agitations, anguish and obsessing ideas." Elsewhere (op. cit., p. 79) Janet speaks of these abnormal mental states as "crises of revery." Janet is not alone in his assertion of the close relation that obtains between habitual revery and so-called "nervous breakdown." In his earliest work (Hysteria and Other Psychoneuroses, p. 9), Freud adds the further statement that "the existence of hypnoid states (i.e., abnormally pessimistic reveries) is the basis and determination of hysteria." Continuing, he says: "We are unable to give anything new concerning the formation of the predisposed hypnoid states. We presume that they often develop from "reveries" very common to the normal for which, for example, feminine handwork offers so much opportunity." The implication here is clearly that conditions of work, if unsuitable, may transform normal reveries into hysterical preoccupation.

In writing these words, more than thirty years ago, Freud was, of course, entirely consistent with the strict medical tradition of his time. But in these days we have come to see that far better instances than "feminine handwork" can be given of the type of occupation which encourages the growth of abnormal reveries. Work

in the factory or machine shop may be various and interesting; it may also be, and very often is, extremely monotonous and depressing. Given that a person of average ability is continuously employed upon a job of extremely repetitive type after the advent of physical fatigue, then a situation is created exactly similar to that described by Janet and Freud as liable to give rise to functional mental disorder. It is difficult to avoid the conclusion that the most fertile cause of industrial and social unrest lies here.

SUMMARY OF FINDINGS

1. As ordinarily carried on, the operation of spinning-mules tends to produce physical postural fatigue. Its relative monotony also induces dispersed thinking and states of revery which are apt to be pessimistic.

2. The introduction of rest-pauses relieves this condition and greatly increases production by (*a*) restoring normal circulation and relieving postural fatigue, and (*b*) effectively interrupting pessimistic revery.

3. In the instance described, the rest-pauses are chiefly effective because they eliminate pessimistic revery.

4. The rest-pauses must be introduced and accompanied by instruction in the technique of relaxation.

5. The rest-pauses are more effective when of regular or assured incidence.

6. By these means, in the instance described, a high labor turnover ("temperamental" in character) was got rid of, productive efficiency increased and the general morale greatly improved.

7. Many types of factory operation resemble spinning in that they encourage states of revery mentally harmful to the individual. Some modification of the present technique would be capable of effective application in such instances.

"Pimco": An Interpretation

The First International Management Congress, Praha, Czechoslovakia, July 20-24, 1924

By Harry Arthur Hopf, *H. A. Hopf and Company, New York City*

"Every phase of labor which taxes the energy of mankind must be so exploited that not even the smallest part of useful effort will be lost. It is only in this manner that we shall be able to cope successfully with the heavy burdens which have been placed upon us and to overcome the poverty which has resulted from the hard times following the War."

THIS statement, freely translated from an article appearing in the German "Prager Presse," over the signature of Section Chief Emil Zimmler, Chairman of the Executive Committee of "Pimco," supplies the keynote to the First International Management Congress and explains the motives which led the Republic of Czechoslovakia, through the Masaryk Academy of Work, to invite international participation in a conference upon the so vitally important problem of management.

BACKGROUND OF THE CONGRESS

It is extremely difficult to portray the earnestness and the serious frame of mind with which the chief scientific and political leaders of this newly formed republic applied themselves to the task of making the plans for the Congress a success. Here was a nation which had only recently found itself, an artificial entity facing severe, almost insuperable difficulties due to conflicting racial aspirations and animosities. On the other hand, here was a people just emerged from a three-hundred year subjugation by a hostile empire which had governed it with brute force and attempted by all means at its command to stamp out its national identity and even its language. Well might this nation, emerging from its age-long and agonizing attempt to hold aloft the flickering torches of patriotism and culture and to remain true to the glorious traditions and achievements of its forefathers, cry out with the psalmist in gratitude that it was at last in "the shadow of a great rock in a weary land."

But in the minds of the leaders of this valiant nation, released from a prison sentence of three centuries and facing—fairly dazzled—the wonderful reality of national freedom, it was clearly discerned that material progress in achieving solidarity and lasting public and private welfare, could only be made by literal obedience to the injunction to "Work and Save." And so they turned their eyes to another nation, the great republic in the West across the

seas, the country that in a time of greatest emergency, had sent to their aid a Wilson and a Hoover—names to conjure with in Czechoslovakia today, names which adorn the principal railroad station and one of the leading streets of Praha, names which by high and low are held in most affectionate regard, if not in veneration.

And here, in this country of ours, they became acquainted with another name, that of Frederic Winslow Taylor the man who through the power of his genius and the force of his intellectual equipment had wrought changes in industry akin to a vast revolution, completely revising current beliefs and convictions with respect to results to be achieved through the proper control, direction and development of human effort, the man whose name will go down through the ages as the father of scientific management, destined to be one of the chief factors in the advancement of human welfare in modern times.

One of the great Czechoslovakian leaders of the past had enunciated the guiding principle that "Our strength lies in science," and so this people, which in the person of Dr. T. G. Masaryk had elected as its President a noted scientist with American affiliations of long standing, turned with avidity to the new doctrine of scientific management and sought in every possible way to apply the underlying principles to public and private undertakings in Czechoslovakia. As an instance of the deep and abiding interest of the Czechoslovakians in all matters pertaining to scientific management, let me cite the fact, stated to me upon good authority, that more copies of the printed report of the Hoover Committee on "Waste in Industry" have been distributed in Czechoslovakia than in any other country in the world, including, I believe, the United States of America.

And soon the Masaryk Academy of Work welcomed to Praha as its honored guest another notable American engineer and leader in the scientific management movement, Frank B. Gilbreth, who through the force of his personality, the earnestness of his presentation and the value of his scientific accomplishments made an ineffaceable impression upon this people, thirsty for knowledge along lines in which this engineer had won an international reputation. Whether it was at the time of Gilbreth's visit to Praha, or later, when he was active as a member of the Masaryk Academy of Work, that the idea of an International Management Congress was broached, is impossible for me to say. To Gilbreth, however, must be given a generous measure of credit for furthering the project and laboring energetically as a member of the Committee on American Participation to bring the plans to successful fruition.

At this point it may be appropriate to record a feeling of some amazement as one's thought turns to the fact that the Czechoslovakians, through their Masaryk Academy of Work, said in effect to the American Engineering Societies and affiliated organizations:

"We need your help. We want to know more about management. We want you to tell us about your most effective principles,

policies and procedures in public and private enterprise. We have faith in your ability as leaders. Come to Praha and show us how you accomplish results. We are selfish in our attitude, we admit, but we are willing to share the knowledge we shall gain from you with many of our neighbors and we shall be glad to welcome them here also as our guests."

This feeling is strengthened as one travels through Europe and realizes acutely the extent of the racial and national animosities, the prejudices and suspicions which have existed since time immemorial. It is indeed astounding that the Republic of Czechoslovakia should have taken so broad and enlightened a stand with respect to arranging for an international management congress and issuing invitations to so many of the other nations to participate therein.

Most of all must one admire the almost childlike faith with which the Czechoslovakians relied upon the American Committee to assume its share of the burden and the utterly unselfish manner in which they submerged themselves for the good of the project which they had called into being, so that they might sit, figuratively speaking, at the feet of their American teachers and absorb the knowledge which they valued so greatly.

American Responsibility

Every thinking American who was privileged to attend Pimco, unquestionably came away with a feeling of deep responsibility toward the fourteen European nations who sent so many hundreds of their representatives to the Congress and with a new realization of the vast opportunity to do good which faces America today in its relations with unhappy Europe. Candor compels the admission that there were Americans in that great gathering who felt as though they should hang their heads in shame when they thought in terms of responsibilities evaded, opportunities unrealized, and services unperformed, all to the end that selfish political aspirations might be furthered while the very foundations of civilization were being shattered.

The First International Management Congress is now a *fait accompli*, and it is the emphatic judgment of all who attended its sessions and took part in its deliberations that the work of the Congress was crowned with genuine success. From the very beginning there was an abundance of evidence of the care and skill with which every phase of the activities of the Congress had been planned by the several committees in charge. Each delegate, upon arrival at his hotel, found in his room a personally addressed package containing an official badge, printed copies of the majority of the papers to be presented at the Congress, official invitations to a number of formal and informal social events, literature concerning Czechoslovakia in general and Praha in particular, and other information of practical value. The Pimco badge proved to be a talisman of special effectiveness; beyond the fact that it gave to the wearer free automobile and street-car transportation, it designated him as one upon whom Czechoslovakians were priv-

ileged to shower courtesies of all kinds and to whom they might extend a quality of hospitality never before equalled in the experience of the most case-hardened habitual delegate in attendance. At least, so runs the universal testimony.

Gilbreth Memorial Service

The opening ceremony of the Congress occurred on Sunday morning, July 20, in the Pantheon, a beautiful assembly hall in the National Museum. Very appropriately the occasion was limited to formal addresses of welcome by representatives of the Government, the City of Praha, the Masaryk Academy of Work, various technical societies, the Americal Minister and others. Responses to these addresses, made by delegates from many countries including the United States, rose, in the case of Belgium, to heights of oratory which were rewarded by resounding applause. The polished diction, the eloquent and graceful delivery, the fire of enthusiasm which characterized Senator Van Overbergh's speech and the glowing tribute paid by him to the United States, which he described as "la bienfaitresse de l'Europe souffrante," will long be remembered by his hearers.

In the afternoon a ceremony of quite a different character took place. The oldest religious edifice in Praha, the St. Martin's Church, which for some time had been utilized as a place of worship by the English and American colonies of the city, was the scene of a beautiful and singularly touching memorial service in honor of Frank B. Gilbreth, who did not live to witness the opening of the Congress for the success of which he had labored so hard. There, at 5:30, the delegates assembled and through specially chosen representatives, paid their tributes to the memory of their distinguished colleague. The occasion was made unforgettable by *a capella* singing on the part of a choir composed of boys and girls, orphans and cripples who had been gathered together, in many cases from the streets, by Dr. Bokule and trained vocally in a most artistic and effective manner. These children sang in Czech and English and, among other numbers, they gave a highly original and effective interpretation of the "Star-Spangled Banner" and a most beautiful rendering of "Abide With Me". When the simple service came to an end, the audience left with hearts deeply touched.

THE CONGRESS AT WORK

On Monday, July 21, the labors of the Congress began in earnest. The spacious meeting rooms of the Obecni Dum (Municipal Building) of Praha had been set aside for the accommodation of the delegates, and at 9:00 a.m., the hour scheduled for the start of the proceedings, were the scene of a most animated spectacle. The official languages of the Congress, English, French and Czech, were to be heard everywhere, but one noted also Italian, Dutch, Spanish and German, the last named language in spite of its extreme unpopularity in Czechoslovakia, being quite in evidence in private conversation throughout the entire Congress. Parenthetically speaking, the official reports

of the proceedings printed in German in the "Prager Presse" from July 20 to 25, inclusive, are much to be commended as a source of valuable reference to those not conversant with the Czech language.

The subject matter of the discussions, both during the forenoon and afternoon sessions, related to the broader aspects of the entire field and was grouped under the general headings of Scientific Management, the Human Element in Scientific Management, and Industrial Relations in Scientific Management. Each session throughout the entire Congress was presided over by both an American and a Czech chairman, the time being divided substantially equally between papers presented by engineers and scientists of the two nations. Dr. H. S. Person, of the Taylor Society, was the American presiding officer at the morning session and Mr. Roy V. Wright, Editor of "Railway Age," acted in a similar capacity at the afternoon session. American authors responsible for papers read and discussed at these two sessions include Messrs. F. J. Miller, H. C. Link and E. L. Cowdrick.

In order to provide facilities for the presentation of lantern slides and motion picture films, the morning session of Tuesday, July 22, took place at the Bio Louvre Hall, one of the large motion picture theatres of Praha. The general subject of the day was Production Management, the afternoon session being devoted particularly to a discussion of Control of General Costs of Production. Professor J. W. Roe, of New York University, occupied the chair at the morning meeting and Mr. Calvin W. Rice, Secretary of the American Society of Mechanical Engineers, presided at the afternoon meeting. Of particular interest were the papers by Mr. G. D. Babcock, presented by Mr. R. T. Kent, on Production Management, by Mr. Maurice Holland on Industrial Research in the United States and by Mr. Howard Coonley on Budgetary Control. Several Czech engineers read papers treating of particular problems in such fields as Agriculture, Industry, Building Trades, Credit Management, etc. The program on this day was particularly crowded, and it is hardly possible for anyone who was not in attendance at the Congress to gain even a limited conception of the great difficulties so ably surmounted by the presiding officers in adhering to the time schedule adopted and in coping with the problem of paralleling the discussions in three languages.

The sessions of Wednesday, July 23, dealt with the major problems of Sales Management, Management in the Coal Industry and Management of Transportation, Messrs. G. W. Coleman, R. T. Kent, and R. V. Wright, acting as American presiding officers of the three subjects in the order named. American authors of papers presented include Messrs. C. K. Woodbridge, S. E. Thompson, L. W. Wallace, and R. V. Wright. As an interestng sidelight on problems which are concerning Continental Europe, the paper by the Czech engineer, R. Zizka, entitled "The

International Automobile Road in Central Europe," may be mentioned in passing.

For the concluding meeting of the Congress on Thursday, July 24, was reserved the consideration of questions of broad governmental, political and sociological significance, such as City and State Administration, State Management and Education. Mr. L. W. Wallace acted as American presiding officer for the first subject, Mr. H. L. Groves for the second, and Mrs. L. M. Gilbreth for the third. Each of the papers presented, and especially those dealing with various aspects of professional education, brought forth able discussions and constituted a fitting climax to the sustained interest which was characteristic of all of the deliberations of the Congress.

CZECHOSLOVAKIAN HOSPITALITY

At the close of the final session appropriate resolutions were presented and adopted. In behalf of the Committee on American Participation, Mr. R. T. Kent, chairman, expressed to the management of the Congress the sincere thanks of the American delegates and their deep appreciation of the conspicuously able manner in which the affairs of the Congress had been conducted. Dr. Basta, President of the Masaryk Academy of Work, responded in an extended address during the course of which he accepted in behalf of the Academy the responsibility, in collaboration with the various American engineering societies, to strive for the perpetuation of the work of the Congress and to lay the groundwork for future international meetings of a similar character. A resolution inviting the Czech and American organizations represented at the Congress to coöperate toward that end was unanimously adopted.

This attempt to interpret Pimco would be sadly incomplete if it omitted to make reference to some of the features of the Congress an appreciation of which will remain permanently in the minds and hearts of those who were fortunate enough to be present in Praha and to be the recipients of the unparalleled hospitality of the Czechoslovakian nation. Every moment that could be spared from the deliberations of the Congress was devoted to a round of sight-seeing, entertaining, official banquets and informal social gatherings planned on so generous, not to say prodigal, a scale, that it quite overwhelmed participants by the magnificence of its conception and the splendor of its execution.

The special trip to Pilzen for the inspection of the Skoda Works and the famous Citizens' Brewery was a highly interesting event and evoked boundless commendation on the part of those who were privileged to be the guests on that occasion. The garden party at the Hradcany, the famous castle of Praha which overlooks the city, was an affair which will long be remembered with delight, and so also the series of entertainments furnished by the Sokol, the celebrated athletic union of Czechoslovakia, and by the Board of Directors of the Electric Street Railway and the Society of Engineers and Architects. The reception tendered to the delegates by the American Minister to Czecho-

slovakia in the beautiful gardens surrounding his official residence completely negatived the prevalent impression concerning the facilities with which American diplomats are provided, or with which they furnish themselves, for the dispensing of hospitality to their compatriots abroad. The American Minister and Mrs. Einstein made each American present feel that he might well be proud of his country's representative at Praha.

As a climax to the activities of the Congress, as far as entertainment and instruction are concerned, came a special four-day trip through a large part of Bohemia and Moravia. This trip, arranged and furnished by the Czechoslovakian Government, provided the invited guests with an unexampled opportunity to become acquainted with the industrial and agricultural development of the country. Space limitations prohibit a description of the incidents and experiences of the trip, but it is the censensus of opinion that it was characterized by an even greater dispensation of hospitality than any preceding occasion. The warmth and generosity of the receptions at all points visited have left an ineffaceable impression upon the members of the journey.

In concluding this account of Pimco, expression should be given to the feelings in the hearts of every American visitor as the time for parting arrived. The inadequacy of words to convey the gratitude, the spirit of friendship, the realization that the end in this case was really only the beginning, makes this an impossible task. Suffice it to say that the name Czechoslovakia has taken on an entirely new meaning in the mind of every American who was a guest of that splendid republic on the occasion of Pimco.

Looking back over the events of the Congress, chief among the outstanding impressions is a recognition of the ability, the aggressiveness and the determination which characterize this new nation and a wholehearted admiration for the indomitable spirit with which it is attacking the serious problems confronting it. With firm reliance upon the mighty forces of science and with a deeply embedded desire to work out its destinies through utilization of all that is good and enduring in its civilization, Czechoslovakia may well be unconcerned about the promise of its future. "Not to see what lies dimly in the future, but to do what lies clearly at hand"—this seems to sum up the attitude of Czechoslovakia as it points a way which might well be followed by other nations.

Without a doubt this little country has added tremendously to the host of its well-wishers through the organization and successful carrying out of Pimco, and the feeling in the hearts of these can hardly be expressed in more effective manner than by the use of the national Czech greeting: *Na Zdar!* (Good Luck).

Forms for Follow Up of New Employees

By William H. Woodruff, *Ingersoll-Rand Company*

A method for keeping in touch with the progress of the new employee is described in this article by Mr. Woodruff, who is Assistant Personnel Director of the company, at Phillipsburg, New Jersey.

RECOGNIZED authorities on personnel practice have swung around to the sound view that the employment office should *select* the new employee but that the foreman, or shop superintendent, should *hire* him. It is still written, however, that a few days after the new employee begins work a representative of the personnel department shall wander casually through the factory, stroll up to the work-bench and in an offhand way ask the new employee how he is getting along; the purpose being to locate misfits and transfer them to more suitable jobs.

LINE EXECUTIVE SHOULD FOLLOW UP

If it is desirable that the line executive hire his own employees, then it is also desirable that he follow them up himself. If someone else does the following up, the line executive naturally feels relieved of the responsibility and is inclined to take even less personal interest in his men than under old-time conditions.

Furthermore, the foreman's authority is definitely weakened. Suppose everything is going well with the new employee who is thus interrogated. He makes mental note that if ever he does get into a jam, he will know where to go—not to the foreman but to the personnel department. Or suppose, as is very frequently the case in breaking in on a new job, that there is some minor matter that is on the new employee's mind—something that he does not quite understand. If nothing is done about it the thing will clear itself up with the passage of a few days' time. On the other hand, if he tells the employment man about it, the latter must necessarily check up the matter with the foreman or shop superintendent. If the management's attitude is right, the matter is investigated, which takes some little time. The fact is brought out that there is really nothing vital involved—and the personnel department is placed in the awkward and unenviable position of "not knowing what they are talking about."

A FOLLOW UP FORM

In order to avoid the undesirable results described above, and yet

provide regular means for some sort of follow up, the accompanying form has been used, with very satisfactory results.

REPORT ON NEW PERSONNEL

Date.....

Name..... Dept..... Sect.....

Job..... Rate..... No.....

Date started.....Days actually worked to date.....

Ability		*Attitude*		*General*	
Incompetent	☐	Hard worker	☐	Outcome uncertain	☐
Limited	☐	Attentive	☐	Recommend change	☐
Qualified	☐	Indifferent	☐	Progress satisfactory	☐
First class	☐	Needs discipline	☐	Valuable employee	☐

Note: Place a check mark in one square in each list.

Remarks:

.....	.....	.....
.....	.....	.....
.....	.....	.....

Signed.....Signed.....Approved.....
Foreman *Gen. Foreman* *Dept. Supt.*

In devising this form, an effort has been made to use terms which are as concrete as possible. Abstract terms such as industry, coöperativeness, integrity, initiative, loyalty, intelligence, etc., have been avoided and every effort made to select terms in common every-day use in the shops, in short, colloquialisms. This eliminates the necessity of definitions, and reduces the rater's task to three pencil check marks and his initials.

EXPERIENCE WITH THIS FORM

In practise it has been found that there is hardly any disagreement among the rating shop executives either as to the qualities being rated or as to the value of the grades under each quality. The one point that has required emphasis is that the employee is rated with reference to *the job that he is now filling* and not with reference to ability that he may possess for some other (or more skilled) work.

When the new employee has *actually worked* for ten days, the information at the head of the form is filled in by the personnel department, and the form is sent to the foreman or immediate supervisor through the shop superintendent and general foreman. The foreman checks one item in each list as indicated, adds any necessary explanatory remarks, and returns the form to the personnel department through the general foreman and the shop superintendent, who make modifying notations if they see fit. If satisfactory progress is reported and other

ratings bear this out, no action by the personnel department is necessary. If "outcome uncertain" is checked, the case may be taken up with the shop executives, or nothing may be done, depending on ratings on other items. "Recommend change" is an unfailing signal that the case should be investigated, and that the employee probably should be transferred to a more suitable job or discharged.

If the employee continues on the job, a second report is secured twenty working days later. If the "general" rating is not "satisfactory" by this time, the case is taken up with the shop executives. If a final decision is not then made—a situation which is found only in very exceptional cases—a third "special" report is secured twenty working days after the second.

In practice, however, it is seldom necessary for the personnel department to take action, as the shop executives are kept in touch with each case through signing the reports, and either transfer the unsuitable employee to another job in the same department or come to the personnel department in person to recommend transfer to another department or immediate discharge.

RESULTS OF USE OF THE FORM

Briefly, this follow-up form leads to the following desirable results:

1. The foreman keeps in close touch with the new employee, so as to be able to make an intelligent report.

2. The higher shop executives keep in uniformly close contact with all their new personnel instead of getting this information incidentally and only in special cases.

3. The interviewers in the employment office see the reports and check up on their own judgment in selecting new employees.

4. The employment manager and personnel director get a definite line on the interviewer's ability.

5. The ratings are entered on the employee's record and can be referred to whenever desired.

An interesting development bearing on the last point is that the ratings may be coded: 111 indicating the best possible report, and 444 the worst, using the digits 1, 2, 3 and 4 to indicate highest to lowest standing under each head. A new employee who is "limited" (3) in ability on his present job but is "*attentive*" (2) to his work, and is considered "*satisfactory*" (2) to the present date, receives the code number 322; and so on.

An important feature of the report form is that the items under "attitude" are listed on the form from best to worst, whereas "ability" and "general" are in the reverse order; but the code numbers all start with highest quality rated as "1." The purpose of this is to discourage the foreman from making a preliminary "halo" rating and checking all items on a par across the page.

Scholarship Fluctuations at Dartmouth

Changes in the Standing of Individual Students

By Richard Wellington Husband and Harold S. Fitz,
Dartmouth College

The ups and downs of individual scholarship throughout the four years of a college course were investigated by the late Professor Husband, Director of Personnel Research at Dartmouth, and his assistant, Mr. Fitz. They found a striking tendency to slump in the sophomore year and to improve thereafter.

MANY facts concerning the scholarship of the classes at Dartmouth have been known for a long time. We have known, for instance, the trend in the general, or average, scholarship of each class, semester by semester. Recently we have learned the relation between scholarship and rank in intelligence tests. Still more recently we learned the relation, for the Class of 1926, between scholarship, rank in intelligence tests, and preparatory school scholarship. Now we present the results of an investigation to determine the scholastic career of the average individual of each class in college.

It is important to know more about what the individuals of a class are accomplishing scholastically; to know whether most of them are improving semester by semester or not; to know whether the average individual, indeed, tends to improve throughout his college course. When, if ever, do the majority of undergraduates begin real scholastic progress? The purpose of the college to encourage scholarship achievement among its individuals—among *all* individuals—makes it important to know these things.

At Dartmouth, student grades in individual courses are recorded as A, B, C, D or E. Each semester, however, these grades are combined into a numerical figure, A being represented by 4, B by 3, C by 2, D by 1, and E by 0. A student getting all C's receives a 2.0 rating; one earning an A, a B, two C's and a D averages 2.4 (12 points divided by 5 courses). Also, each semester the numerical grades of all individuals in a class are combined into a numerical class average.

Now these numerical class averages, or similar existing data, do not supply the answer to questions concerning the scholarship trends of individuals. The fact that the numerical average of a class during one semester is higher than that of the

preceding semester is not sufficient evidence that the majority of the individuals of the class have actually improved their standing, nor does it indicate even whether the average individual has raised his standing. It may well happen that a comparatively few students who increase their standing greatly will more than offset an appreciable lowering of scholarship by the majority of the class. Suppose that the class average increases from 2.2 in one semester to 2.4 in the following semester. We cannot, therefore, assume that the majority of individuals in the class have improved during that time. The opposite may well have happened, for an extraordinary increase in the grades of a few may account for the whole difference in the average numerical standing of the class. The numerical average of a class may decrease from 2.2 to 2.1 from one semester to the next, but at the same time it may well happen that the majority of individuals in the class have actually improved their scholarship. The records of a few who had a spectacular fall may account for the decrease in the numerical average of the class.

HOW STUDENTS' RECORDS WERE COMPARED

To obtain a true picture of the scholastic history of the individuals of the college it has been necessary, therefore, to make an investigation of a new type. This study covers the record of the Class of 1923 for eight semesters, of the Class of 1924 for six semesters, and of the Class of 1925 for four semesters. The methods used and the results obtained are here described.

The history of each class was studied separately. The record of each individual entering college was regarded as a unit. For the purpose of presenting the scholastic history of each undergraduate semester by semester, his first semester's average standing was taken as a basis and with this all succeeding semesters were compared. An index number of 100 was arbitrarily assigned to the student's initial semester average, no matter how high or how low that average was. Each semester average thereafter was divided by the first semester average and a series of values obtained for semester standings computed in comparison with the initial index number of 100. For instance, a student had the following semester averages: 2.1, 1.9, 1.8, 2.1, 2.3, 2.5, 2.7 and 2.9. The index number of 100 represents the value of his first semester's rank. The second semester value is found by dividing 1.9 by 2.1 and multiplying by 100. This process was followed throughout the eight semesters. Thus, for this particular man the following series of index numbers was obtained: 100, 90, 85, 100, 110, 120, 130, 140. The scholastic history of this undergraduate therefore was that he lowered his scholastic average in his second and third semesters by 10 per cent and 15 per cent. He returned in his fourth semester to the level of his first semester He improved 10 per cent in his fifth semester and continued

TABLE 1

Frequency table—variations in scholarship, by individuals, class of 1923

INDEX NUMBERS	SEMESTERS							
	1	2	3	4	5	6	7	8
Above 300		3	3		2	4	5	5
275–300				2	1		2	6
250–275		2	1	5	3	6	5	6
225–250		1	3	2	2	5	7	10
200–225		12	8	9	15	16	14	15
195–200						1	1	1
190–195				2	1	2	3	1
185–190			1		2	2	7	10
180–185		2	2	3	5	2	6	6
175–180			5	1	9	5	5	10
170–175		1	2	2	3	6		5
165–170		1	1	4	5	8	11	10
160–165		6	2	8	5	5	10	6
155–160		1	2	2	8	11	15	10
150–155		8	7	10	12	8	11	*14
145–150		3	2	1	7	6	*11	11
140–145		3	11	12	14	12	24	16
135–140		12	7	11	*25	*17	19	22
130–135		11	6	9	11	10	18	20
125–130		12	12	16	14	29	19	23
120–125		27	20	*30	38	21	*23	*30
115–120		17	17	21	22	18	26	18
110–115		*37	*37	36	*31	34	40	30
105–110		48	24	18	24	*38	30	19
101–105		16	12	15	13	13	*10	10
100	620*	65	42	*45	28	32	23	*30
95–100		*17	13	20	16	9	18	10
90–95		55	*32	31	*32	*27	16	17
85–90		51	42	50	31	26	6	10
80–85		*34	40	*34	24	30	13	10
75–80		21	*37	25	22	13	6	11
70–75		24	24	18	9	11	10	6
65–70		21	25	23	11	13	3	6
60–65		21	10	15	3	7	1	7
55–60		6	10	8	5	6	4	2
50–55		5	13	13	3	7	3	
45–50		5	3	3			2	1
40–45		7	12	4			1	1
35–40		4	7	5	1	1	1	
30–35		2	2	1				
25–30		1	4					
Below 25		10	5	1				
Total men	620	562	506	515	457	461	429	425
First quartile man	155	141	127	129	115	116	108	107
Median man	310	281	253	258	229	231	215	213
Third quartile man	465	423	381	387	345	348	324	321
First quartile class*	100	110–115 =112½	110–115 =112½	120–125 =120	135–140 =135	135–140 =135	145–150 =145	150–155 =152½
Median class*	100	95–100 =97½	90–95 =92½	100	110–115 =110	105–110 =107½	120–125 =120	120–125 =120
Third quartile class*	100	80–85 =82½	75–80 =77½	80–85 =82½	90–95 =90	90–95 =90	100–105 =100	100

Median and quartile values in the distinctive classes are interpolated to the nearest 2½ per cent.

the improvement steadily to the end when he stood 40 per cent above his standing of the initial semester.

Index numbers were computed for each individual in the class in the manner just described. A work sheet was constructed to provide for the insertion of the index numbers from 400 down to zero. Close to the basic figure of 100, index figures were provided for at intervals of five; farther from the base number, the intervals were larger because fewer men were involved.

A frequency table was devised which showed the number of men having index figures semester by semester within the intervals adopted in the work sheet. Table 1 shows how many students in the Class of 1923 had index numbers falling within each of the specified intervals. In the first semester all the members of the class were rated 100, since this was the value arbitrarily assigned to everybody at the beginning of the course. In the record of the second semester the index numbers run all the way from 400 down to zero. If a student has an index number of 200 in this semester the meaning is that he improved his average standing 100 per cent. Possibly he went from 1.4 to 2.8. If in the second semester he had an index number of 50, the meaning would be that he lowered his average from 1.4 to 0.7. Perhaps it should be repeated that semesters are not compared with preceding semesters but all are compared with the first semester.

It will be noticed that the larger number in each semester cluster around the basic index figure of 100. The greatest point of frequency fluctuates down or up to some extent. This would seem to indicate that a considerable body of the undergraduates do not change their standing very materially from the time they enter college until they leave, and the lines on the charts which accompany this article give evidence that this is the case.

It should also be noted that the total number of cases considered semester by semester gradually decreases. This is due to the fact that men are separated [dropped] from college and others leave for various reasons. This condition should cause no confusion in the comparison of average individuals semester by semester, since in every case the standing of an individual in any one semester is compared with his own standing in the first semester. All the individuals averaged in the second semester are included in the statement of the first semester; but in the first semester there are also those who left college at the end of that semester. So it happens that all of the undergraduates whose standing is averaged during the last few semesters have their standing averaged in the early semesters of their course. The average standing of the 425 individuals in the eighth semester is compared only with their own standing in the first semester. There are simply additional persons in the class during the first few semesters who must be averaged in with the others in order to find the true averaged individual of the class during those semesters.

TYPICAL SCHOLARSHIP TRENDS

The next step was to choose from the figures of the frequency table of each semester the appropriate individual to represent the class as a whole. It was decided that the simplest and perhaps truest average was the median. The middle man of the class as arranged in the frequency table according to index numbers was chosen to represent the whole class. For example, if there were 579 men in the class in a given semester, number 290, according to the arrangement of the frequency table, was regarded as the median. The middle or median man was found for the class in each semester. The index number of the man so chosen was regarded as the index number of the class for the semester. For the Class of 1923 the index numbers for succeeding semesters were 100, 97½, 92½, 100, 110, 107½, 120 and 120. These index figures were considered as representing the scholastic career of the average man of the Class of 1923.

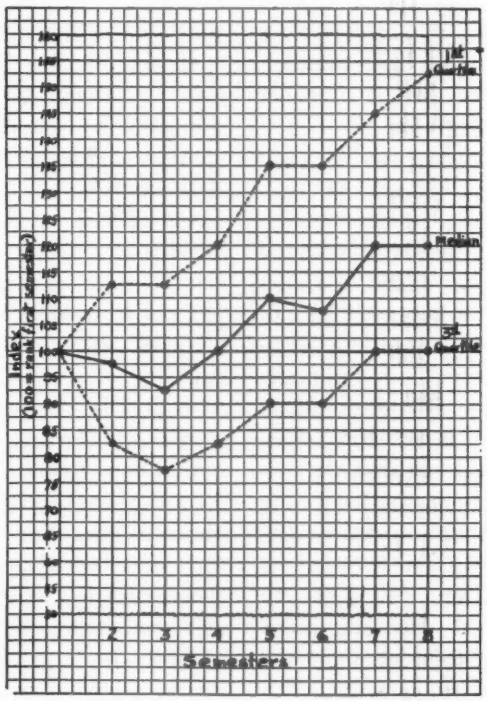

FIG. 1. VARIATIONS IN SCHOLARSHIP, 1923, SHOWING TENDENCY OF INDIVIDUALS TO VARY IN SCHOLARSHIP, BY SEMESTERS

To give a more nearly complete representation of total individual experiences, the careers of the first and third quartile men were also plotted. The index number was determined for the man standing on the border line between the highest

quarter and the next quarter of his class in each semester. The same computation was made for the man standing on the border line between the third quarter and the lowest quarter of his class. The numerical values of the median and of the first and third quartiles are indicated on the frequency table by asterisks. Thus the upper line represents the trend in the scholarship of the man who in each semester stood on the border between the first and second quarters of his class. The median line represents the trend of the man who in each semester stood in the middle of his class; and the lower line represents the man who stood on

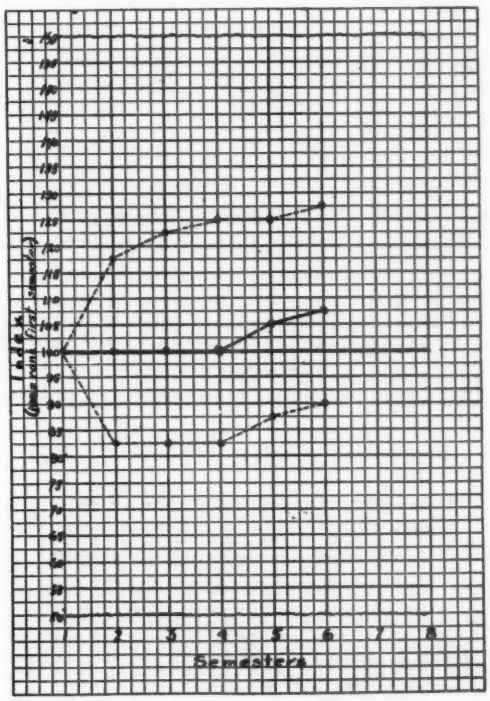

FIG. 2. VARIATIONS IN SCHOLARSHIP, 1924

The history of these three averages, studied together in combination, gives a fairly complete picture of what happens to the individual composing any one class.

After the median and the first and third quartile points were computed for each semester, lines were plotted to indicate the trend of the scholarship of these three averages. the border between the third and fourth quarters of the class (figs. 1, 2 and 3).

Half the class in each semester is included between the highest and the lowest lines. The general trend of these two lines indicates where half the class stands in scholarship. It is worth observing that three-quarters of the members of the Class

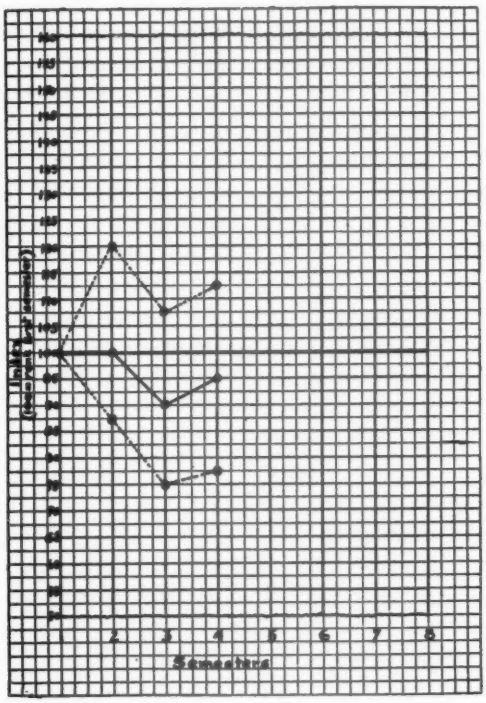

FIG. 3. VARIATIONS IN SCHOLARSHIP, 1925

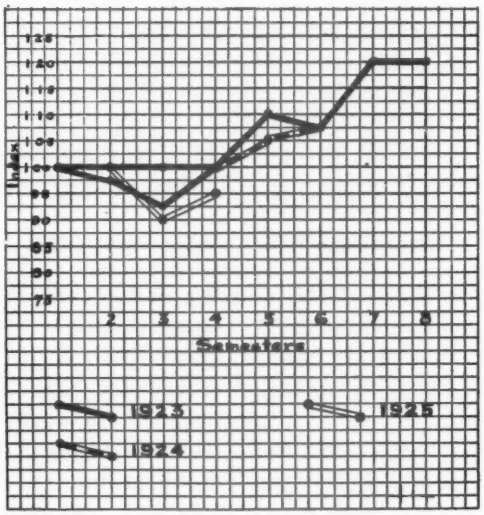

FIG. 4. VARIATION IN SCHOLARSHIP OF INDIVIDUALS FOR THE CLASSES OF 1923, 1924, 1925, BY SEMESTERS. (100 = STANDING OF 1ST SEMESTER)

of 1923 stood above their starting point in their Senior Year. The whole trend of the space between the highest and the lowest lines runs upward from the middle of their Sophomore Year. In the case of the Class of 1924 the trend does not start upward until the first semester of Junior Year; while in the Class of 1925, after a very decided downfall, it starts upward in the middle of Sophomore Year.

Another chart was then prepared which showed the lines representing the middle man of the Classes of 1923, 1924 and 1925. This combination chart (fig. 4) is for the purpose of easy comparison of the average man of these three classes. It would have been more satisfactory to have had the completed records of three successive classes; but the classes immediately prior to 1923 were in college during the war. The college was very small and uncertain of its constituency from semester to semester. Moreover, it seemed best to endeavor to indicate conditions at the present time rather than at some time in the past, for these may change materially in a comparatively few years.

CAUSES OF THE SOPHOMORE SLUMP

A study of the charts reveals several facts of importance. In the Class of 1923 the average man lowered his scholarship standing somewhat in the second semester of his Freshman Year and lowered it again in the first semester of his Sophomore Year. Then in the second semester of his Sophomore Year he raised it to normal. In the Class of 1925 this average man had a somewhat similar history. He slumped very badly in the first semester of his Sophomore Year and recovered slightly in the second semester of that year. In contrast with the average man of these two classes the man who stood in the middle of the Class of 1924 maintained his standing consistently through the first two years. In two of the three classes studied, the first semester of Sophomore Year was the worst of all the eight semesters.

If we can assume that these two classes show the normal tendency and that the Class of 1924 was exceptional, we are immediately faced with the explanation of the downfall of this particular semester. It has often been held to be a question of morale. The Sophomore class is traditionally in an attitude different from the attitude of the same men while they were freshmen and different again from their attitude when they were Juniors and Seniors. This may be a partial explanation but is obviously not a complete answer. It is probable that an equally important factor is the list of new subjects commonly studied by Sophomores. In the Freshman Year the majority of the subjects taken are a continuation of the subjects presented for admission to college. The Freshman knows how to work on these subjects, knows what is expected of him, and goes ahead with his work in just about the same way in which he worked while he was in high school. The change comes at the beginning of the next year. He gets into the social sciences, or into new forms of

laboratory work, or into philosophy, psychology and other subjects. He anticipates that he is going to have a good deal of satisfaction out of these subjects but for some reason he finds them different from what he expected. The methods of instruction are new to him and in general he finds his courses more theoretical and less exact than the subjects of Freshman Year. He frequently gets lost in the theory. This is undoubtedly the occasion for the downfall of many Sophomores who do not at all show the spirit that traditionally belongs to the Sophomore.

WHY DO SENIORS GET HIGHER MARKS?

Beginning with the Junior year there is a rather decided tendency for the averages to improve. At first sight this might be simply a matter for congratulation on the ground that students are becoming more serious and more inclined to do substantial hard work. But there are other facts to be taken into consideration. The required subjects, to some of which almost every student objects, are pretty well off their hands and they are able to select subjects in which they find less difficulty. So it frequently happens that Juniors and Seniors can get better marks than they got during their first years in college, without doing any more work. In fact an investigation made a year ago at Dartmouth College showed that the Senior Class spent about one hour a day less in classroom and in private study than the Freshman Class did. Apparently then it is easier to secure good marks in Senior courses than in Freshman courses.

This may be an indictment against our major system. It does not seem to be a good preparation for the future that in the upper years of college life students should receive higher grades for less work than they did earlier in their college course. Nor does it seem quite right that the demands made upon their time should be less than the demands made upon the time of underclassmen, no matter what their pay in grades may be.

Such problems as these, then, are brought out by this study. Further investigations need to be made, and the scholarship trend of the average man of several succeeding classes found, before definite answers to these questions can be made.

News Notes

PERSONNEL RESEARCH FEDERATION

The meeting of the Board of Governors of Personnel Research Federation held in New York on October 18, marked a distinct forward step. Representatives of a majority of the twenty organizations affiliated in this federation for furthering research pertaining to personnel in industry, commerce, education and government, were present to hear gratifying reports of progress and to decide regarding policies and plans. Robert M. Yerkes, Acting Chairman, presided.

Membership

The Treasurer's Report was presented by Wesley C. Mitchell. The Secretary, Alfred D. Flinn, stated that the total membership, including research organizations, business concerns and individuals was 75. Two organizations were admitted to the Federation: the Research Bureau for Retail Training of the University of Pittsburgh, and the School of Business Administration of the University of Michigan.

The Secretary then stated that funds had been subscribed for a period of years, by friends of the Federation, to enable it to carry forward its program; and resolutions were adopted "expressing deep appreciation of the generous financial contributions of the donors who have made possible the beginning on a practical scale of the activities outlined for the Federation by its founders."

Appointment of Director

The election was announced of W. V. Bingham to be Director of Personnel Research Federation. Colonel Bingham has been, since 1915, a member of the faculty of Carnegie Institute of Technology, where he has been identified with the movement to promote coöperative relationships between industries and educational agencies in research, particularly in the psychological and social sciences and their practical applications.

Headquarters

A budget for the year beginning October 1, 1924, was adopted. It was voted to incorporate, and to establish the official headquarters in New York City. The thanks of the Federation were extended to Engineering Foundation for its provision of temporary office accommodations in the Engineering Societies Building at 29 West 39th Street, New York City.

A Committee on Organization, consisting of Messrs. W. V. Bingham, Chairman, Matthew Woll, Leonard Outhwaite, Frankwood E. Williams, Harry A. Hopf and Alfred D. Flinn, was authorized to carry through the act of incorporation and to recommend minor changes in organization which this move makes necessary. This committee is also charged with the selection of a small Board of Technical Advisers, representative of the several fields of scientific study which contribute to knowledge of workers in relation to their work. The appointment of committees on Ways and Means and on Program was also authorized.

Program

The program of work for the current year was considered under the four headings: Information Service, Planning, Promotion, and Conduct of Research.

Information Service. 1. Continuance and development of Journal of Personnel Research as the official organ for publication of the results of investigations.

2. Preparation of card index and beginning of a library of sources of information about personnel research.

3. Discovery and collection of unpublished reports and notes of research on questions of industrial fatigue and industrial hygiene, including mental hygiene; hiring, placement and training of workers; methods of wage payment; non-financial incentives and rewards; personnel records and forms; methods of personnel administration, vocational guidance and placement in colleges and schools; selection and development of executives; and other live topics of personnel research on which data are often buried in the files of business concerns, trade associations, labor organizations, government bureaus and university departments.

4. Exchange among members of the Federation of available research information, bibliographies, forms and other aids.

Planning. 1. Inventory of current researches, research facilities and available workers.

2. Survey of outstanding problems, their relative importance, feasibility and likelihood of commanding support.

3. Planning in detail for one or more selected projects.

Promotion. 1. Promotion of interest in the purposes and methods of the Federation through occasional articles in the public press, addresses, attendance at meetings, and personal conferences.

2. Help member organizations to further their research programs by furnishing the counsel of the Federation's Technical Advisers, in

a. Formulating definite problems.

b. Finding competent trained investigators.

c. Developing suitable research techniques.

d. Securing adequate facilities and financial support.

Conduct of Research. 1. Major investigations, as heretofore, will be made under direct supervision of member organizations. Activities of the central office will be mainly concentrated on its functions as a clearing house for research information and as an agency for furthering and coördinating "research pertaining to personnel in industry, commerce, education, and government, wherever such researches are conducted in the spirit and with the methods of science."

COLLEGES COÖPERATE IN TESTING TESTS

A coöperative experiment has been organized for the purpose of developing tests that will be of general administrative value to college executives and will also measure probable success in college. As the first step, a combination test has been prepared, containing 8 tests that have been tried and are submitted as worthy of further trial, by Messrs. H. T. Moore, Dartmouth College, Carl C. Brigham, Princeton University, A. W. Kornhauser, University of Chicago, L. W. Hopkins, Northwestern University, Donald G. Paterson, University of Minnesota, and Thelma Gwinn, University of Chicago. It has been edited by L. L. Thurstone, University of Chicago, and has been given to incoming freshmen at the above mentioned institutions this fall.

The American Council on Education with offices at 26 Jackson Place, Washington, D. C. is headquarters for this coöperative experiment. It printed the test form with instructions for use, and sells it at cost of production and mailing to institutions desiring to take part in the experiment. Copies of the test form are available at $6.00 a hundred. The 8 tests cover 20 pages and require somewhat more than 2 hours to give them all. The time can be shortened at will by omitting some of the tests.

Besides directions for giving and scoring the tests, instructions are furnished for correlating the findings of the tests with the regular college ratings of the students. Each institution can thus determine how well the tests predict success in its own college work. The American Council is planning to compile next summer the results from all institutions that send in reports. This compilation will determine the reliability of these tests as predictive of probable success in the first year of college and will serve as a basis

for issue of an improved test for further try-out.

Psychologists and others who are experimenting with tests in colleges are invited to submit tests that have proved useful for consideration in making up future test forms. By this process it is possible to pool the significant experiences of all, and to secure adequate data for determining the reliability of new tests as aids to college administration and as measures of probable success in college.

PITTSBURGH PERSONNEL ASSOCIATION

The Pittsburgh Personnel Association has inaugurated an interesting policy in reproducing the papers of special interest read at the monthly sessions of its Employment Plans Section. Two papers were reproduced and sent to all members from the meeting of October 9. Both are on the subject, "Sources of Labor Supply." One is by John Priest, Assistant Superintendent of Employment of the Westinghouse Electric and Manufacturing Company and the other by W. N. Cunningham of the Standard Sanitary Manufacturing Company. Both papers give interesting material on the various nationalities and their characteristics as workers in various departments of the plants.

The paper by Mr. Priest gives an excellent summary of the actual outside sources the employment manager must keep in touch with in order to know where available men are. On the whole the most satisfactory source resulting in the best workers, lies in those men recommended by the employees already in the plant.

The practice inaugurated by the Pittsburgh Association has value in spreading abroad the different methods found best suited in different communities. If regularly followed it will constitute a valuable record of progress and of change in method.

VOCATIONAL GUIDANCE SERVICE FOR PROSPECTIVE ENGINEERING STUDENTS

Announcement is made of the establishment of a Vocational Service for High School Students who are contemplating a course of engineering training. This service is the outgrowth of nine years of research by Prof. L. L. Thurstone, of the University of Chicago. The investigations which have lead to the present development were begun at Carnegie Institute of Technology and carried forward under the auspices of the Society for the Promotion of Engineering Education and the National Research Council. The service is intended primarily for high school seniors and graduates. It consists of examinations in arithmetical reasoning, algebra, technical information, mechanical aptitude, geometrical construction, physics problems, grammar, ability in solving puzzles, ability in estimating, and a general mental alertness test. The examinations require about 7 hours all told, which may be divided into half-hour periods. The norms and standards of comparison have been obtained by checking the test-performance of many thousands of engineering students against their actual records of success in engineering schools. Further information regarding this service may be obtained from the Guidance Department, C. H. Stoelting Company, 3037 Carroll Avenue, Chicago.

TRAINING IN MOTION STUDY

Dr. Lillian M. Gilbreth is planning to give, beginning in January, 1925, a four months intensive course of lectures and laboratory work designed to train young plant executives to equip and operate a motion study laboratory. This course will be given at 68 Eagle Rock Way, Montclair, New Jersey.

Book Reviews

APPRENTICE EDUCATION

A Survey of Part-Time Education and Other Forms of Extension Training in Their Relation to Apprenticeship in the United States. Federal Board for Vocational Education, Washington, D. C. Bulletin No. 87, Trade and Industrial Series, No. 25, June, 1923. Pp. xiii + 518

REVIEWED BY J. C. STARK

The bulletin is not a complete discussion of apprenticeship, and is not intended to be a text book on the subject; rather it is a sort of encyclopedia for those interested in apprenticeship training, and is the first of a series of bulletins to be issued by the Federal Board on apprenticeship problems. It was prepared by Jennie MacMullin Turner, Ph.D., Research Assistant, State Board of Education, Madison, Wisconsin. The study was begun in 1920 as a survey of the Part-Time School System, Wisconsin, and developed into a nationwide study as it was rounded out by the Federal Board with supplementary material from reports of the various State boards for vocational education.

"While Wisconsin is the only state which has a law providing for state supervision of the contract and training of apprentices, many states and local communities are now voluntarily coöperating in the interest of better educational opportunities for their prospective artisans. Under the Wisconsin law apprenticeship training is an integral part of the work of the part-time schools in that state."

Without specific apprenticeship laws, many states through the development of part-time schools are making apprenticeship training an integral part of the public school system. Success in this work is directly proportional to the degree of coöperation between industry and the part-time schools. No serious difficulties have been encountered where the part-time school has been organized to meet the individual needs of the employed youth.

Early apprenticeship laws in the United States permitted parents to bind out their children to learn a trade, and benevolent societies bound out orphans and dependent children, indenture lasting until the apprentice became of age. A contract was filed with a magistrate and if the contract was broken, the guilty party could be summoned to court and punished. The kind of work to be performed was left to the discretion of the employer. Instruction in some useful art or trade was to be given and the apprentice could obtain a reasonable education in reading, writing and arithmetic.

Some conclusions regarding the present situation may be presented to show the scope of the inquiry.

"There is no agreement in the educational world as to what the standards should be as to the relative value of education before employment and education after employment." The annual list of legislative grists reflects the various philosophies of the informed and uninformed as to the proper place and value of full-time and part-time education. Probably the authors of these enactments are not to be censured too severely, since a comprehensive and organ-

ized body of material has not been previously brought together for their reference and use. But it must not be assumed that the same plans in operation in one locality must necessarely be the best for another, since industrial conditions are so varied.

"Every city and every state should be gathering all the data at its command concerning the opportunities open at present for the education of its employed workers and the results obtained under each method of handling the situation. These data should be available for the whole country."

Apprenticeship education should be considered as a part of the public school system as well as a method applicable under certain circumstances, to all our secondary schools, higher institutions and continuation schools; a method which by changing these full-time intitutions to part-time institutions would solve some of their most difficult problems. What are the obstacles in the way of such a program? "Before the apprentice method can be accepted generally for high schools and colleges, the whole educational philosophy of most people including a large percentage of the educators of the country must be changed." The "camel theory" must be discarded. One Wisconsin high school principal said, "We have the continuation school in Wisconsin because the high school has failed in its duty. If we will put our house in order, we can keep all the children of this city in the full-time high school, and there will be no need for the continuation school." Here is the "camel theory" arrayed in all its glory, the assumption being "that the child is an intellectual camel, who can take his education in a prolonged meal, an educational gorge; store it up in an intellectual hump, and live off the hump all the way across the desert of life." "It assumes that the school is able, by itself, to furnish a balanced ration. It disregards the law of decreasing returns from one type of activity, the law of satiety of appetite, and the value of exercise in restoring appetite. It makes education a stuffing process." It overlooks the possibilities of making education a continuous life-process and ignores entirely the educational value of work for youth as well as adult.

It is easier to forbid than to control; so it is easier to assume that industry is a poor place for young people than it is to attack the problem of converting industry into educational facilities plus an honorable, interesting and profitable way of making a living. But the time has come when the educator must study the matter of coöperation and coördination between the school and industry and grasp hands with the men of industry who together will seek for the gradual solution. Industry has its part to play in this program. The discussion here presented does not attempt to figure the proportionate distances that both parties must travel before they meet. There is a lot of house-cleaning to be done on both sides.

Many students may go through high school and college on a full-time basis without stopping or growing fagged, but for those who become bored with school there should be outside contact. Many who apparently are not bored would get a stimulus from variety that they are unaware of because they have not tried it.

"Is education a burden or an opportunity?" This rather startling question is well answered in the discussion. The "need for incentives" is handled from various angles: that of the coöperative school, of the compulsory part-time school, of wages, of promotion in industry, and of higher education.

"All education must be education for choice of actions," is another outstanding point. The occupational objective should be emphasized as the child enters adolescence. Early in his school career every child should have his attention directed to the day when he must make his choice of a vocation.

Vocational guidance cannot be sandwiched in here and there with civics or English—the two catch-alls of school life. Something can be done in these subjects; something can be done and should be done by every teacher in every subject, beginning early and continuing throughout the educational process; and guidance should continue well into the earlier years of occupational life. Guidance is not English. It is as important as English. "It is as impor-

tant to vocational education as running lathes or setting up type."

Part II of the *Bulletin* has for its subject "Educational Opportunities for Employed Workers in the United States Through Part-time, Evening, and Extension Classes Provided by the Public or by Industry; A Summary by States." The discussion and statistics for each state are given uniformly according to the following outline.

1. Provisions of part-time and evening-school laws
2. Extent of educational opportunities for employed workers
   - A. Public
     1. Part-time
        - (a) General continuation
        - (b) Trade or industrial
        - (c) Coöperative—elementary and secondary
        - (d) Coöperative—higher institutions
        - (e) Quasi coöperative
     2. Evening and leisure hours
        - (a) General and professional (incomplete data)
        - (b) Trade or industrial
   - B. Corporation training
     1. Apprentice schools
     2. Other than apprentice
   - C. Training under the auspices of unions, or under the joint auspices of unions and employers in coöperation with the public schools. (Not numerous examples, as many cases are classed under occupational or trade-extension courses.)

Appendix 1 to Part II discusses ten Chicago continuation schools with an enrollment of 11,350 for 1921. It gives their early history, the curriculum, equipment, etc., and tells of the work done in connection with several large plants, especially in the packing industries. The "Cycle" plan and difficulties encountered are also taken up.

Appendix 2 gives full statistics of part-time education in Wisconsin, the relation of the new law to the full-time school, and extracts from a large number of letters from local officials in Wisconsin concerning their part-time schools.

Part III covering 331 pages is devoted to "Description of Selected Institutions or Classes Offering Part-time Instruction to Employed Workers." Following are a few illustrative cases.

The College of Engineering and Commerce, University of Cincinnati, in 1906–1907 enrolled 107 on full-time and 27 on the coöperative plan. In 1921–1922 there were none on full-time and 970 on the coöperative basis. In 1906 there were fifteen firms cooperating and in 1921 the number had risen to over 200. Success depended on the sort of coördination between the work done in the college and that in the industries, and the "plan works only when it is in the right hands."

The Massachusetts Institute of Technology coöperates with two electrical concerns and limits the number of men to 50 each year. The training at the works is laid out and conducted with a view to obtaining the maximum educational value and is intimately correlated with professional training at the Institute.

In ten New York City high-schools, students are assigned in pairs, one in school the other in industry, changing about each week. Work in the school is related to work in industry by a coördinator employed by the school board for each school. The coördinator visits the work to observe the students and to confer with a representative of the company. Students at work are paid at the usual rate of compensation. Dr. Haaren, Associate Superintendent of Schools in charge, cites the following conclusions drawn from a report on the work done. (1) Employers will employ on this basis. (2) Industry profits by it. (3) Plan is applicable to industrial establishments, the salesroom, and the business office. (4) High schools can arrange programs to meet it. (5) Valuable supplemental instruction to students. (6) Time spent in employment does not necessarily prolong period of high-school attendance. (7) Provides for continuing education. (8) Opens desirable permanent business and industrial

opportunities to students. (9) Student is keener and more alert in his school work than before. (10) The supervision of the pupil by the coördinator is one of the most valuable features of the plan.

Ralston Industrial School, Pittsburgh, Pa., had in 1921–1922 fifty boys enrolled in the coöperative course. Boys completing the trade apprentice course (four years of high-school and one year of trade) are accepted as journeymen by employers and journeymen's associations. As students they are paid the same wages as other apprentices in the shops in which they work. Courses are arranged to lay a foundation for skilled trades and also to prepare for engineering schools. The strongest point of contact with business and industry is secured through the Public School and Industrial Relations Section of the National Association of Corporation Training (now the American Management Association). The discussion reports approximately 100 men and women connected with the schools and industry working together on four standing committees as follows: (1) Vocational analysis. (2) Vocational demands. (3) Functions of public schools in training for vocations. (4) Functions of the industry in providing training for employees.

The Textile Industrial Institute, Spartansburg, S. C., within 80 miles of which half of the South's cotton manufacturing takes place, furnishes a fascinating story, which shows what can be accomplished in spite of obstacles. Although the prime object is not to teach industry, the Institute demonstrates how industry can be used to support the student while he is in school. At present one main purpose seems to be "to do the training of the future bosses and superintendents of the southern cotton mills." One remarkable statement is that "grown-up near-illiterates get ready for college in three to five years" and "hold their own in every phase of college life with the public school product."

A large portion of the remainder of the manual is given over to the schools maintained by industry. Typical illustrations are given and the reader is easily enabled to contrast the extent of this work with that done by the school system.

The pamphlet should be a part of the library of every educational director of continuation school work and of teachers in all apprentice schools.

FACTORY MANAGEMENT

By Henry Post Dutton. New York: The Macmillan Co., 1924. Pp. vi + 329

Reviewed by F. E. Schuchman

Although *Factory Management* is primarily written for students taking a formal course in problems of management, it will serve equally well to help the man on the job to see the whole problem of management instead of a few phases only. The author has succeeded in giving to the literature on management a "somewhat connected theory of control." He has avoided technical details, thereby enabling one to gain a complete picture rather than a closeup on some problem that often obsesses the specialist's mind.

Twenty-nine chapters of carefully chosen material deal in turn with Financing, Selling, Types of Production Control, and so on through the whole gamut of management structure that ordinarily bewilders the uninitiated. One is carried along from chapter to chapter because each chapter is related to its fellows. This relationship exists because Mr. Dutton finds that a distinct problem in developing a correct structure of organization, and a special technique of system and operation" has evolved from the need for method in assign-

ing to each man work that will fit into the general scheme. Thus the pattern is laid; and because the general design has been definitely sketched, no favors are given to one subject and withheld from another.

Each chapter yields ideas that stamp the author as a man with a message. Under Finance he says, for example, "In any business of considerable size it is desirable to maintain regular relations with several sources of borrowed funds, to have checking accounts and make loans with two or more banks and to keep in touch with investment houses." In the chapter on Time and Motion Study he emphasizes the need for study of the machinery, its foundations, shafting speeds and feeds, etc., before the actual timing of operations is started. And again (on page 130) he repeats his warning concerning the study of the machinery, but goes further and adds that "no study of operation efficiency is complete that does not audit, and where needed, revise, all the auxillary functions of design of product and tools, supplying and movement of materials and auxillaries, and control and planning of operations."

Only one unfavorable criticism need be made. On page 130, the author says, "Workmen usually try to work effectively unless discouraged by poor management. The beam of managerial incompetence should be removed before attention is given to the mote in the eye of the workman." This bears the ear-marks of having come from the greatest of managerial contributions: the *Waste in Industry Report* of the Federated Engineering Society. Imagine the reader's disappointment when he discovers that in this year 1924 a book on Management is published without citing the "Manager's Bible" either at the end of a chapter or in the thoroughly arranged General Index. A second edition of this book will surely be required. When it is, we hope Mr. Dutton will repeat that classical finding of the engineers who worked under Herbert Hoover in compiling the Waste Report, namely, "that more than seventy-five per cent of the waste of industry is due to inefficient managerial control and less than twenty-five per cent is due to inefficient labor." And, of course, many other quotations from that book of facts should be incorporated in a volume of this kind.

Both publisher and author are to be commended for the general style and high standard of typographical workmanship.

SOCIAL PSYCHOLOGY

By Floyd Henry Allport. New York: Houghton Mifflin Co., 1924. Pp. xiv + 453

REVIEWED BY JOS. U. YARBROUGH

This book is not an easy book to review. It is much too interesting.

Professor Allport's course of procedure is new. Whereas former texts in Social Psychology have seen social units, social aggregates functioning and have attempted to study these groups as such, Allport begins with the individual and through the individual proposes to arrive at an understanding of social behavior. To quote: "Only within the individual can we find the behavior mechanisms and the consciousness which are fundamental in the group;" and, "There is no psychology of groups which is not essentially and entirely a psychology of individuals." He utterly refutes the "group fallacy" of the older social psychologists—all the notion! of "crowd mind," "crowd consciousness" and the like. "Social Psychology is the science which studies the behavior of the individual in so far as his behavior stimulates others, or is itself a reaction to their behavior and which describes the consciousness of the individ-

ual in so far as it is a consciousness of social objects and social reactions."

All this disavowal of older methods one gets from the introduction and the first chapter, and it is somewhat disappointing to swing back from this new viewpoint to a stereotyped and tedious treatment of the nervous system. We think this might have been condensed or omitted, for the reason that this book purports to be for students already well grounded in the rudiments of psychology. The idea back of this detailed treatment is justified, however, even though the treatment itself is tedious. His own exposition of this underlying idea is:" . . . . To reduce human behavior to its fundamental terms—prepotent reflexes, habit formation, thought and emotion." Thus upon a foundation dug down even to prepotent reflexes in the individual he proposes to build an understanding of the group to which the individual belongs. All of part I, approximately 150 pages, is devoted to this detailed study of the individual. It is significant that Allport has been able to frame a consistent exposition of individual behavior without the use of the familiar but desputed instinct theory.

Part II, headed Social Behavior, follows a parallel course, from simple, basic forms of group conduct to the highly complex. There is a section devoted to the group activities of insects and very low forms of animal life. Here the author retains the instinct theory.

A long and painstaking chapter treats language from the standpoints of physiology, anthropology and sociology. In a summary at the end of the chapter the author does treat the importance of language in a study of social psychology, but the fact remains that the chapter is irksome. College juniors and seniors were frankly bored with it. In fact, the first half of Part II would be greatly improved by a vigorous weeding. The rest is excellent, despite a more than perceptable flavor of Freud. Allport's Freudianism is improved by numerous grains of salt from the author. His chapters on social attitude, responses and adjustments are splendid, and though at times he borrows liberally from the material of sociology and ethics his borrowing is always well done and to the point. It is refreshing to find that customs, traditions, fashions, and the like—items which composed former texts—are relegated to a comparatively brief chapter at the very end of the book.

To repeat, Allport's course of procedure is new, and so successful that we are ready to say that it is outstandingly the one adequate text in Social Psychology. We consider it one of the most searching and thoughtful books in psychology in recent years.

Abstracts

The Influence of Alcohol on Duration of Life. RAYMOND PEARL. Proceedings of the National Academy of Sciences, 1924, Vol. 10, No. 6, pp. 231–237.

Reports results of an investigation made to determine whether the consumption of alcoholic beverages in *moderation* has any effect upon life expectancy, or if it has, what the nature and sense of that effect is.

The material gathered consists of records of certain pertinent data in the life histories of many thousands of persons belonging to the working class population of Baltimore. The records were collected by trained eugenic field workers who visited the families and by long-continued and patient investigation got the facts with a high degree of accuracy.

For lack of space it was not possible to go into all the details of actuarial procedure followed in calculating the life table from this material. A skeleton outline is given.

The results found are as follows:

1. The material as a whole is normal from an actuarial standpoint.

2. At every age from 30 to 100 inclusive, the persons in the "all moderate" class of workers, whether male or female, have a somewhat higher expectation of life than do the persons in the "abstainer" class of the same age. The two life curves are not widely different, but what advantage there is lies with the moderate drinkers.

3. Male persons in the "all heavy" class have a markedly lower expectation of life at all ages from 30 to 100 inclusive than do male persons in the "abstainer class" up to and including age 60. From age 60 on, the expectation of life is somewhat though not greatly higher in the "all heavy" class than in the "abstainer" class. This result is believed to be possibly due to a selective effect of the very high mortality in the heavy drinking group prior to age 60. In the case of females, the expectation of life is markedly lower for the persons in the "all heavy" group than for persons in either the "abstainer" or the "all moderate group," at all ages from 30 to 100 inclusive.

4. The "moderate steady" class, which is from certain points of view the most important one, shows consistently the highest expectation of life at all ages from 30 to 100 inclusive, in the case of females, and also in the case of males, except that after 70 the "all moderate" male group has very slightly higher expectations than the "moderate steady" male group.

Action of Dilute Alcohol on Human Subjects. W. R. MILES. Proceedings of the National Academy of Sciences, 1924, Vol. 10, No. 7, pp. 333–336.

This study on the influence of ethyl alcohol on human efficiency concerns moderate quantities and dilute solutions and is based on 166 laboratory experiments.

In a series of 44 trials of which 23 were non-alcohol, a study was made of typewriting efficiency and simple acts. Six experiments were characterized by rectal injections of the alcohol. In 70 trials with a well-trained subject, urine samples were collected and the alcohol content determined. Finally a comparison of the alcohol content of blood and urine samples was made on a group of 9 men when 27.5 grams of alcohol were taken.

Results show that unless a specific dynamic action for alcohol be assumed those changes, which definitely occurred under the carefully controlled and routine conditions of these experiments, apparently represent a decrease in organic efficiency due to depressant action of ethyl alcohol, inasmuch as they are regularly associated with decreased reflex irritability, slower reaction, less keen, i.e., higher sensory thresholds, slower muscular movements, less adequate and accurate muscular control, and less agile mental operations. The whole qualitative picture is one of decreased

human efficiency as a quickly following result from the injection of this pharmacodynamic substance.

The Effect of Temperature on the Human Body. Science Service. Science-Supplement, 1924, Vol. 60, No. 1540, p. x.

Experiments by the Department of the Interior investigators at the Pittsburgh experiment station of the Bureau of Mines showed that the human body in a state of rest and in still air cannot endure indefinitely a temperature higher than 90°F. with 100 per cent relative humidity. The stouter and heavier men when subjected to uncomfortably hot temperatures lost more weight than the lighter and thinner men, but could endure such temperatures for a longer period and complained less of exhaustion. Subjects who drank icewater freely after exposure to high temperatures felt no ill effect.

It was found that the exhaustion and weakness following subjection to a very high temperature and humidity for a short period is not so severe as subjection to a moderately high temperature and humidity for a longer period.

The pulse rate, rather than the rise in bodily temperature, apparently determines the extent of the discomfort experienced by the subject. Subjects became very uncomfortable after the pulse rate exceeded 135 pulsations per minute and complained of unbearable and distressing symptoms when the pulse exceeded 160 per minute.

The Differential Diagnosis between Organic and Functional Nervous Conditions Following Injury. Arthur S. Hamilton. Bulletin of the United States Bureau of Labor Statistics, 1924, No. 359, pp. 58–68.

"Pure malingering, or the simulation of disease or injury without any basis whatever in fact, is relatively rare, but the tendency to exaggerate disease and especially the effect of injury, and to claim compensations for very trivial affections, is very common."

The degree of severity of conditions which are determined largely in terms of what the examiner himself sees and feels are not readily simulated or exaggerated, but there is a group of conditions whose manifestations lie largely in the ability of the patient himself to see, hear, smell, feel sensation, tenderness and the like. Here it is that the malingering find their favorite field.

The mental attitude of the patient is of great importance in compensation cases. Grave physical injuries are not as a rule followed by serious and prolonged nervous disturbances. Indeed it may even be said that severe physical injury often serves as a protection against what is commonly known as nervousness. The fact is that the nervousness seen so often in compensation cases arises usually from emotional causes and not from actual physical injuries. It, therefore, becomes a matter of great importance to determine that which is dependent on physical conditions which perhaps can never be relieved and that which is dependent on an unhappy state of mind and would probably shortly disappear if compensation were adjusted and the case closed. It is scarcely necessary to say that in each case a history should be taken with the utmost care. Questions should be asked clearly and in an understandable language, but care should be exercised to avoid leading questions. Leading questions in fact are so likely to bring forth a certain type of answer that malingerers may often be exposed by asking as to the existence of symptoms which to the patient, would appear likely in connection with the injury, but which the examiner knows are entirely foreign to the case and only serve to make it ridiculous.

In general the more definite and clear the statement of his complaint, the more honest the patient. On the other hand, the individual who wishes to deceive deals in vague generalities. When asked to indicate the seat of a pain or an area of tenderness, it is diffuse, vague, incapable of localization.

When a full and satisfactory history has been secured, this should be followed by an equally careful examination. Those with real injuries do not object to a careful examination. Of all the symptoms of disease, pain is the one most easily simulated. The malingerer's weakest point will be his tendency to overdo the matter. When he finally submits to an examination, he com-

plains of pain long before he can possibly have been hurt. This is seen also in his exaggerated facial and other contortions, his cries and groans, and his complaint of the extreme pain he is suffering. Nowhere is the location of pain, in compensation cases, so frequent as in the back. If a man's back has really sustained a serious injury, the pain is usually induced on pressure only over a limited area and even then only on fairly deep pressure. When the painful back is only of mental origin, there is increased sensibility to even the slightest touch of the finger tips. True pain is usually accompanied by an increase of pulse rate of from 20 to 30 points and by a dilation of the pupil at the moment the pain is induced. Malingering in relation to the motor system is less common than in the sensory system. Fortunately for the examiner, though the patient may easily allege a partial or complete motor loss, he can not produce the other phenomena associated with motor paralysis. In injuries involving the brain, the cord and the peripheral nerves, certain alterations necessarily appear in the volume, power and tone of the muscles, and in the reflexes—all of which are demonstrable by anyone familiar with even simple methods of examination. Several of these tests for motor malingering are described.

Mental Hygiene in Industry. HENRY B. ELKIND. Journal of Industrial Hygiene, July, 1924, Vol. 6, No. 3, pp. 113–120.

Problems of personnel administration are virtually problems of mental hygiene. The expression "Mental Hygiene in Industry" is practically synonymous with Personnel Administration for both deal with the human being; their differences are not in kind but in degree. The mental hygienist's study of human nature is deeper and more basically sound; his viewpoint is likely to be broader. However, in the past few years a new type of personnel worker has evolved—the college graduate who has specialized in personnel work. His knowledge of human nature is broader than that of the personnel worker. Both the mental hygienist and the personnel worker have aims in the same direction, the adjustment of the employee to his industrial environment. The future personnel worker will place more and more weight upon scientific knowledge of procedure in dealing with the human being.

As an example of what mental hygiene in industry has done in the proper placement of employees, the results of a recent investigation in a large mercantile establishment are summarized. One hundred and thirty-three junior employees were given a general intelligence test (Otis General Intelligence Test). Results of the test show that there is some positive relationship between general intelligence and clerical ability. It was also found that while high scores were regularly obtained by those considered very efficient, the inverse of this was not always true.

A modified form of the Scott Graphic Rating Scale for non-executive employees was used and each junior employee was rated by one or more executives for a period of three months. The data were given the following statistical treatment:

1. Rating for each quality was considered separately for each month for each rater.

2. Ratings for each quality were again considered separately for each month but not in relation to the raters.

Experience with the rating scale indicated that it (1) tended to keep employees and executives in close touch with the employment department; (2) tended to keep the question of personality more or less alive in the minds of the executives; (3) required very close supervision.

Two cases are given in detail to show how necessary it is to elicit physical, mental and social factors in cases of industrial maladjustment. Some figures are given to emphasize the seriousness of mental maladjustment which may result in functional nervous disease.

The Group-Mind in Trade Unionism. C. DELISLE BURNS. Journal of the National Institute of Industrial Psychology, 1924, Vol. 2, No. 3, pp. 116–124.

Proposes to attempt a very general analysis of the mental facts or events in the groups called trade unions. Two preliminary assumptions are made. First, that the effect of the mind on mind is to form a

"mind-group," the formation of which does not limit or destroy the separateness of the minds so united. Second, it is assumed that the phenomena of British Trade Unionism may be treated as typical of Trade Unionism generally. The mental characteristics of trade unionism are of two kinds, general and specific, that is to say, some are characteristics to be found in most, if not in all, trade unions, others are characteristics which distinguish one trade union from another.

General characteristics: The first general characteristic of the mental outlook of trade unionism is a tendency to opposition. The non-trade union world is viewed as if it were an opponent. This characteristic is due to the historic experience of trade unionists. A second general characteristic is the sense of growth. All trade unions seem to feel that they are a part of a movement which has had a surprising development, promising perhaps a still greater future.

Of the specific characteristics of trade unions, some are due to diverse occupations, craft-fellowship. A different specific characteristic is conservatism. The mind-group in trade unionism tends to conservatism of craft or trade practice; and hence, also, the trade unions are sometimes looked upon as obstacles to changes in machinery or working methods. Another specific characteristic arising from occupational differences is the simple-mindedness of certain groups. By simple-mindedness is meant the attitude from which reaction only occurs if issues are presented in a very simple form, as for example, when a war is presented as a dog fight.

From the same occupational source come other differences in the characteristics of mind-groups in different trade unions. For example, the attitude and emotions of a member of the National Union of Railway Men are very different from those of a member of the Miners' Federation.

Another characteristic in the group-mind arises from the size and organization of the units. Everyone knows that it makes a difference to one's attitude if one is a member of a large or of a small group. The characteristics of a citizen of a very small State are noticeably different from those of a great Empire and in the same way the group minds of trade unions differ.

The Income Cycle in the Life of the Wage-earner. EDGAR SYDENSTRUCKER AND WILLFORD I. KING. Public Health Reports, August 22, 1924, Vol. 39.

Points out that the income of the wage-earner follows a sort of a cycle depending upon certain factors. Material from a detailed study of the economic status of about four thousand families of workers in twenty-four South Carolina cotton mill villages was used as a basis for this study.

The following analysis of this material was made:

1. Each family was rated according to economic status, the measure used being the average weekly family income per ammain for the two months preceding the visit.

2. Two procedures were then used to ascertain variations in economic status at different stages of family life: one approached the problem from the point of view of the family as a unit; the other from the point of view of the individual at different ages.

In order to depict the economic variations in family life, families were classified according to the period which had elapsed since the women were married. The mean income of all families was found to be about $5.50 per ammain per week. The following conclusions were derived from the above classification:

1. In the first few years of married life the family income is above the mean.

2. With the coming of children, the family income is lowered below the mean for a period of about 10 to 15 years until children begin to work.

3. When children are working, family income rises above the mean.

In the second procedure individual members of all families were classified according to their age distribution and their incomes. In the case of females it was found that

1. From 15 to 19 years the income of the families in which they lived was relatively high.

2. From 18 to 40 years there was a decline in their economic status (18 years was found to be the modal age at which marriage occurred among women).

3. From 40 until 55 years there is continual improvement; then another decline sets in.

The variation for males was quite similar to that of females except that the decline in the economic status in the young adult occurred five years later. This was accounted for by the fact that the modal age at which marriage occurred among men was about 23.

The following general conclusion was made:

"Our study goes no further than to outline the general character of the economic cycle in the lives of an actual wage-earning population and to indicate that at certain periods in the lives of such population the pressure of economic conditions is measurably greater than at other periods."

Employment Terminology. FRED TELFORD. Public Personnel Studies, 1924, Vol. 2 No. 5, pp. 152–167.

Central employment administration has been a fact for some forty years in the public service and for more than ten years in industry and yet there has not developed a terminology that is generally accepted even with regard to the most fundamental ideas.

There is great need for an accepted terminology in order to facilitate the orderly handling of employment matters. Personnel administration in the public service and in industry is not so far developed that it is possible or even desirable to decide once for all just what term shall be used for a given purpose. A stage has been reached, however, which amply justifies a fair trial for a good many terms with definite meanings.

In view of the above considerations, some one hundred employment terms with definitions are tentatively advanced. These terms are based a great deal more upon the terminology of the public employment group than upon that of the private employment group. The terms and definitions, moreover, are working more than tentative. The ideas attempted to express are all needed in the public employment field at least, and most of the terms suggested have been tried out in several jurisdictions and found successful. A term good enough to be accepted in employment terminology ought to meet the following tests:

1. Suggestiveness and descriptiveness. A term should be self-explanatory or at least suggest to a large extent what its meaning is and therefore require little explanation.

2. Adoption into the vernacular. Some terms which have many theoretical advantages for one reason or another do not get into the vernacular and are not generally used in their correct technical senses by personnel administrators, employees, job seekers and others.

3. Used both in the public services and in industry. It is a powerful argument in favor of any term that it has already found a place in the terminology of both the public and private employment groups.

A good term must also meet some negative tests. The most important of these is that the term should not carry with it academic, "high brow," bureaucratic, red tape or political connotations.

The hundred terms and definitions are arranged in alphabetical order as:

Allocation of Positions to Classes. The assignment following the development and adoption of a classified service to the appropriate classes.

Annual leave. See discussion under Leave of Absence.

Applicant. Any person who has filed a formal application (generally written) for employment in a position in the classified service.

The Origin of the Modern Occupational Classification in Personnel Administration. EDWIN O. GRIFFENHAGEN. Public Personnel Studies, 1924, Vol. 2, No. 6, pp. 184–195.

Traces the development of the modern occupational classification in personnel administration from the first faint beginnings by the Chicago Commission in 1908.

The keynote of the new classification idea was struck in the report for 1908 of the Chicago Civil Service Commission. It wrote:

"Reclassification and grading of the service on the basis of duties performed and the establishment of uniform salaries in the grades constitute the most important work during that period. It will be seen, therefore, that in its reclassification adopting duties instead of salary as a basis for grading, the Commisssion is following a clearly defined purpose."

The subsequent work on classification was done by the Efficiency Division of the Chicago Civil Service Commission. In 1909, the classification work carried on involved the study of the duties of the entire service, including approximately 15,000 employees. The work of classifying continued until March 1911. An important development growing out of the early work of the Efficiency Division was the placing of emphasis on the classification of the individual positions themselves rather than on the classification of a mere line of work. An appraisal, thirteen years after, of the early classification work in the Chicago community shows that the original classification ideas and the policies and practices based on those ideas have stood the test of time.

Suggested Tests for Policemen. FRED TELFORD AND F. A. MOSS. Public Personnel Studies, 1924, Vol. 2, No. 4, pp. 112–145.

Throughout the United States and Canada the feeling is fairly general that police administration in cities does not meet the demands of our present day civilization. Many of the ills of which complaint is made can be traced to lack of proper personnel on the police force. Some of the blame must therefore, be placed on the civil service commissions which select the recruits. Two outstanding weaknesses are: (1) improper classification of police positions. To any intelligent person who gives the matter serious consideration it must be pretty obvious that certain qualifications which are desirable in the police officer traveling a beat give no assurance whatsoever of success for a traffic officer, detective, or member of the vice squad; (2) improper emphasis on some necessary qualifications. There has been a strong demand for large men well developed physically who make a good showing when on parade and when dealing with obstreperous law breakers. In most police work, the power to analyze situations, to appreciate the motives which govern people in their conduct, to understand, interpret and apply laws and ordinances, to deal with human beings impatient of restraint, to understand and carry out the policies and directions of superior officers, and to deal with trouble by preventing it from becoming acute, are far more important traits than making a good showing on parade or overpowering by pure muscular strength some potential or actual law breaker who refuses to obey commands.

This article has as its primary purpose to aid in securing a better police personnel through suggesting means of bringing about a better balance between the physical and mental standards to be used in selecting patrolmen. The tests suggested are for selecting patrolmen and not those on special assignments.

QUALIFICATIONS FOR PATROLMEN

1. Minimum qualifications. The equivalent school education; intelligence equal to or greater than indicated by a score of 65 in the army alpha tests; ability to comprehend and carry out instructions and to make simple written reports; ability to understand, interpret and apply laws, ordinances, and police rules and regulations; ability to size up situations and people and to deal with people individually and in groups; keen observation; even temperament; good moral character; good physical condition; strength; agility; height not less than 66 inches; weight not less than 132 pounds and properly proportioned to height; age not less than 21 years and not more than 29 years.

2. Desirable additional qualifications. Education equivalent to that required for graduation from high school and preferably college training; experience as a member of an organization in which there is contact with considerable numbers of people of different kinds; intelligence greater than that indicated by a score of 95 in the army alpha tests; knowledge of criminology and of social problems.

TESTS SUGGESTED FOR SELECTING PATROLMEN

The following tests, weighted as indicated, are suggested as best suited to determine the qualifications of applicants, having in mind the cost in time and money of giving the tests and thoroughness with which qualifications should be determined.

Test 1. One of the five alternative forms of the army alpha intelligence tests (total time required slightly less than an hour). Weight 2. (A minimum required score of 65 on the army alpha scale is suggested.)

Test 2. Accuracy of observation (total time required about 25 minutes). Weight 1. (Fifteen questions, based on some drawing or photograph, to be answered from memory, and the recording from memory, of the identifying marks of ten automobile license tags.)

Test 3. Memory tests (total time required about 20 minutes). Weight 1. (Five questions on verbal order—or description to be answered from memory; the recording from memory of ten facts from a description containing about fifteen facts; and the identification from memory of the photographs of ten persons displayed among the photographs of 48 persons.

Test 4. Understanding of laws, ordinances, police rules and regulations, and other printed material (total time required about 25 minutes.) Weight 1. (Forty questions based on the content of printed material placed in the hands of competitors when the test is given.)

Test 5. Police duties (total time required about 30 minutes.) Weight 1. The identification of ten crimes from definitions of crimes and from descriptions of cases placed in the hands of competitors and the answering of 20 questions in the so-called "multiple choice" form with four answers from which to choose.)

Test 6. Education and experience (total time required about 10 minutes). Weight 1.

Test 7. Personal traits as determined by interview. Weight 1.

Test 8. Medical and physical tests. Weight 2.

Test 9. Character investigation. No rating or weight.

The reasons for suggesting these particular tests and for using the kind of material included is given in some detail in the succeeding sections of this article. The suggested material for one complete examination for Patrolmen is given in Appendix 1. In Appendix 2 there is additional material of the kind used in tests 2, 3, 4 and 5, which is included to facilitate the construction of additional tests of the same kind.

Suggested Tests for Hospital Attendant. F. A. Moss. Public Personnel Studies, 1924, Vol. 2, No. 5, pp. 167–179.

The tests suggested in this article are based upon the assumption that a considerable body of civil service administrators are anxious to handle the recruiting problems involved in finding, testing and certifying hospital attendants in better fashion than has been the case in the past and that assistance to them in devising tests which may be given to applicants will be welcome. The tests have not been standardized, but enough work has been done with them to indicate that they are of the right degree of difficulty and that they are free from serious administrative objections.

Duties and qualification of hospital attendants. The duties of a hospital attendant, as the term is used in this article, may be defined as follows:

"Under immediate supervision to assist in the work involved in providing for the case, well-being and comfort of patients in a hospital for the mentally diseased or defective and to assist in other routine work in and about such a hospital as required."

Examples of typical tasks: bathing, feeding, and dressing patients; keeping patients and beds, clothing and quarters clean; observing patients and reporting their actions and condition; keeping order and maintaining discipline; assisting a nurse in the care and handling of patients; when required, assisting a physician; assisting in the dining room, kitchen, office, laundry, clothes room or other place; overseeing the work of patients; assisting in a receiving room.

The minimum qualifications should be, ability to read and write; ability to under-

stand and carry out instructions; willingness to work and live in or near a hospital for the mentally diseased or defective; even temperament; patience, firmness, cheerfulness, cleanliness; good physical condition; strength; endurance.

Desirable additional qualifications would include, education equivalent to the completion of the elementary school course and preferably high school training; experience in nursing the sick or caring for the mentally diseased or defective.

With these qualifications in mind, the following tests are proposed:

Tests 1, 2, 3 and 4. Written duties tests (total time required about 30 or 35 minutes). Weight 5. (Understanding of hospital rules and regulations; the recognition of certain mental diseases; general information; and arithmetical reasoning. A required minimum rating of 60 is suggested.)

Test 5. Education and experience (total time required about 10 minutes. Weight 1.

Test 6. Personal traits as determined by an interview. Weight 2.

Test 7. Medical and physical tests. Weight 1.

Four forms of tests 1, 2, 3 and 4 have been prepared. These forms are given in this article along with the directions and practice questions.

Scientific Selection of Taxicab Drivers. A. J. Snow. National Safety News, 1924, Vol. 10, No. 1, pp. 5 ff.

Unquestionably the first and perhaps the most important step in safety for both the patrons of the taxicab company and motorists and pedestrians who share the streets with the cabs, is the selection of safe drivers. How to secure safe drivers is one of the most difficult problems confronting taxicab operators.

The personal factors in safe driving may be classified as follows:

1. Selection of the driver.
2. His training.
3. Harmonious industrial relations.

The author secured a job as a taxicab driver and spent some time at the wheel, mixing with the men on duty and off, learning much about the taxicab driver personally and his problems. After this preliminary experiment, Dr. Snow conducted tests on individual drivers, rating them from three angles—intelligence, carefulness, and reaction to sudden danger.

The first test is much like that employed in the Army. It is a written test designed to ascertain the applicant's powers of attention, observation, memory, ability to follow directions, etc. The moron, or person of very low intelligence, is thus quickly discovered and eliminated.

But intelligence is not the only qualification of a safe driver. A man may have a very alert mind and at the same time be habitually careless or reckless. To test the driver's "bump of caution," he is taken into a room and told to handle certain objects and perform certain operations. The manner in which he follows directions and the time he takes to do it are carefully noted.

But even if a man is naturally careful he may lose his head when confronted with an emergency. To determine his presence of mind the applicant is told to operate an electrical board which may give him an unexpected scare. He is cautioned beforehand to shut off the switch and step on what corresponds to the brake of an automobile if anything unusual happens.

If the driver passes all three tests satisfactorily, he is presumed to be a safe and competent person to operate a taxicab. When the tests made of De Luxe Cab drivers were checked against the accident records of the men, it was found that they tallied in more than 90 per cent of all cases.

It is the plan of the National Association of Taxicab Owners to make these tests available to all employers of commercial drivers.

The Selection of Engineering Apprentices. Max Tagg. Journal of the National Institute of Industrial Psychology, July 1924, Vol. 2, No. 3.

The selection of engineering apprentices has largely been on the basis of (1) an interview of the candidate by the firm's representative, and by (2) a consideration of the references supplied by the candidate, and of the school records he holds. In a few cases an entrance examination has been required.

For the past three years, the National Institute of Industrial Psychology has successfully carried out a series of psychological tests for the selection of engineering trade apprentices. In this plan of selection the following factors have been taken into account:

1. The level of general education required in the trade.
2. The level of general intelligence required.
3. The specific abilities required.
4. The temperamental qualities, some of which may be advantageous; others may be detrimental.
5. The home or family history (including the medical record) of the candidate, and how far it is likely to influence his success at work.

General Electric Develops Practical Tests. Babson's Reports, September, 1924, pp. 6–7.

Under the guidance of Mr. Johnson O'Connor, the General Electric Company at the River Works, Lynn, have been using some tests which are not to be classified with psychological tests.

One of the tests used is described as follows: A cube of wood sawed into nine irregular sections is shown to the candidate. It is explained to him that it is his job to put it together again as quickly as possible when it is knocked down. The standard time was determined by giving the test to 400 individuals doing the actual work for which the test was designed. It was found that the best of them could set up the cube in 3 minutes or less, the next grade in 4½ minutes, the next took 7½, and the remainder longer than 7½. These tests gave a classification of A, B, C, D. This particular test is used to pick out individuals who are able to work mechanically. Such jobs as tool workers, die makers, machine set up men come under this classification.

Test 2 consists of an aluminum block with one hundred holes in it, of a particular size, and the task is to pick up with the fingers three hundred brass pegs and put them, three at a time, into the one hundred holes, using only one hand. The idea is to pick out people with unusual deftness and dexterity—chiefly for small assembling work. Speed in accomplishment is the sole requisite.

Test 3 grew out of Test 2. Here an aluminum block is used with three hundred smaller holes in it and the task is to pick up the pins with tweezers and place them, one in each of the thee hundred holes. This test is applicable to some special work in the plant.

Test 4 is a test for clerical workers. It consists of two parallel columns of figures, some of which are identical and some not. The task is to check as to whether or not they are identical. In this test, speed and accuracy alike are counted, principally accuracy—and the standards were set by trial on 400 who were making good at the clerical work in question.

The way that Test 4 works in practice is shown in a table, which gives the rating of 43 candidates who took the test at the beginning of apprenticeship and were reported by their instructor at the close of the period.

Thus out of the 43, 13 made Grade A, and all but one of these turned out to be either very good, or good. Ten made Grade B and of these, 3 were very good and only 2 less than good. Eleven made Grade C and of these only 1 was very good, 4 good and the rest fair or poor, and 1 was dropped. Nine made Grade D, and of these all but 1 was dropped and that 1 became only fair.

Thirty-six hundred employees have taken this clerical test; 75 per cent of those who in two years, made very good were in Grade A; 17 per cent were in Grade B, 6 per cent were in Grade D. All applicants for work in the jobs covered by the test are required to take the tests and selection is made in accordance with the showing in the test—none being taken who fall below C. Candidates take the test alone.

Vocational Guidance and Job Analysis. The Psychological Viewpoint. Morris S. Viteles. The Psychological Clinic, 1924, Vol. 15, Nos. 6 and 7, pp. 157–183.

Purposes to discuss the relationship between the scientific study of vocations and vocational guidance. The term vocational guidance has been used in both a restricted

and a general sense. In its restricted sense, it refers merely to the guidance of children of the working age level in the choice of a vocation. In the more general sense, the term vocational guidance refers to the direction of the education of the individual child—education in the school, the home, the playground—from infancy to maturity so that the child may be prepared for the vocation best adapted to his interests and abilities, in which he will render greatest service as a member of the social organism.

In this article, the emphasis is upon vocational guidance in the restricted sense. The discussion is limited to the relationship between the study of vocations and the actual problem of guiding children at the working age level. Actual choice of vocation is given first consideration. Such guidance presupposes a very thorough analysis of vocations in terms of the mental qualifications necessary for success in them.

In vocationally guiding both children and adults, the vocational counselor must consider the following factors with reference to the individual he is counseling:

1. Interest
2. Competency
3. Temperament
4. Health
5. Education and experience
6. Appearance
7. Social and economic factors

Interest refers to the desires of the individual. If interests are diverse, it is the problem of the vocational counselor to determine for which vocation among a number in which the individual is equally interested, he is most competent.

Competency refers to the mental ability of the individual to meet the requirements of a given vocation.

The specific mental abilities used in this investigation and suggested for use in job analysis are:

Energy, rate of discharge of energy, endurance, control, coördination, initiative, concentration, distribution of attention, persistence, alertness, associability, discriminability, accuracy, memory, understanding, observation, playfulness, intelligence, intellect, judgment, logical analysis language ability, executive ability.

By temperament is meant the motives, the urges in the individual's make-up.

By health is meant not only the physical state of the body as a whole, but the degree of development and the functional soundness of each part of the body.

Education and experience differ with reference to the amounts and kind of education necessary for success in various vocations.

Appearance must be weighted in regard to the various vocations.

The seventh essential for adequate guidance is a consideration of the social and economic conditions influencing the life of the one being guided.

Detailed information is given as to the better ways of measuring each of these items.

Some Phases of Student Personnel Work in the School of Commerce and Administration. A. W. KORNHAUSER. The University of Chicago Magazine, 1924, Vol. 16, No. 8, pp. 301ff.

Gives a suggestive sketch of the personnel procedures used in the University of Chicago School of Commerce and Administration. First considered is the research side of the problem of selective admissions. The average high school grades have been studied in relation to success in the work of the first year in college. The coefficients of correlation have been in the neighborhood of 50. Psychological tests of several kinds have also been compared with first year college grades. On the whole, the agreement has been about the same as in the case of high school grades though there appears to be considerable variation from year to year. During the current year, the correlations between the tests used and grades for the first quarter were:

Otis Test of Mental Ability	0.47
Terman Group Test of Mental Ability	0.60
Reading Examination	0.55
Iowa High School Contest Examination	0.57

The Downey Will-Temperament Test and a quantitative questionnaire on likes and dislikes were also used, but correlations are not yet available. Each student was also interviewed for four or five minutes by an assistant dean, an instructor in psychology, and a representative of the student council. The ratings agreed very poorly with one another; the highest coefficient of correlation was 0.40. The correlations between these ratings and grades for the first quarter were low—average of 0.18.

In order to see how much predictive value the application forms and reference reports had, ten advanced students estimated the abilities of the students from the forms. Most of this material has not been evaluated. Correlations reported were:

Between estimates based on application blanks and grades of the first quarter in college 0.15.

Between estimates based on application blanks plus reference reports, and grades of the first quarter 0.33.

In the last case the estimates by certain of the judges correlated as high as 0.55 and 0.65 with grades.

A second class of personnel activities is that dealing with records of progress and the basing of administrative decisions and disciplinary action upon these.

In addition to the usual records and reports a rating system is being used, more or less experimentally, which secures judgments from instructors at the close of each school quarter. Ratings are given on seven character traits and in addition the instructor may indicate that a student is especially well fitted for any of six classes of business career, and that he is markedly excellent or deficient in expression ability.

The most important of recent investigations has been an analysis of the rating scale results. The study of the rating scale has tried to do two things: To find out how reliable or dependable the estimates are; and to arrive at some of the factors which explain the discrepancies and inaccuracies. The average correlation between the sets of ratings by pairs of instructors has been about 0.40. Instructors agree with themselves from quarter to quarter to about a 0.60 correlation. When the averages of several instructors were taken by sets of three ratings, the correlations were disappointingly small, usually about 0.40. With a series of ratings where the students were better known, the correlation between sets of three ratings averaged about 0.70.

The author is of the opinion that the outstanding cause of the unreliability of ratings is the inadequate acquaintanceship of the instructors with their students.